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THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2

Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229.

No. XXIII., OF VOL. II., 1935. LONDON, SATURDAY, DECEMBER 7, 1935 Pp. 136—Price 1s.
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No. 5858 LONDON, SATURDAY, DECEMBER 7, 1935 CCXXIX

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ADDRESSES AND ORIGINAL ARTICLES

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By W. H. C. Romanis, M.B., M.Chir. Camb., F.R.C.S. Eng.

SURGEON TO ST. THOMAS'S HOSPITAL AND TO THE CITY OF LONDON HOSPITAL FOR DISEASES OF THE CHEST

My interest in the treatment of "surgical" aneurysms dates from a series of 35 cases of traumatic arterial and arteriovenous aneurysms with which I dealt in the few years immediately after the war, and in connexion with which I had the advantage of the advice and assistance of the late Sir George Makins. The cases described now are however a different series and are of wider general interest because they are all civilian cases and not war injuries.

The aneurysms essentially suitable for surgery are naturally those of the neck and limbs, and as a rough general rule it may be laid down that the nearer the trunk the aneurysm is, the more difficult and delicate is its operative treatment. The cases here described have all been treated by open surgical operation, though of course it is well known that certain aneurysms can be benefited by such other procedures as compression, needling, electrolysis, and general medical measures. A bewildering variety of operations have been practised for aneurysm in the past; such procedures as ligature of the main vessel just above, or some distance above the sac, distal ligature of the main vessel or of certain branches, ligature above and below the sac, and direct excision of the sac, having all been extensively practised, while Matas' suturing operations have occasionally been done. Some of the operations are invested with the historical romance of long antiquity, such as the operation of Antyllus. Nowadays there is little doubt that, if it can be performed, the formal operation of excision of the sac with ligature of all branches entering it, as close to the sac as possible, and non-interference with the accompanying vein, is the operation of choice. Often it is impossible, either because of the situation of the aneurysm, its size, its adherence, or the patient's age or weakness, but in many such cases a cure is obtainable by one of the other surgical procedures, the most promising being ligature of the main vessel immediately above the sac.

As is well known, most of these so-called peripheral aneurysms occur in the flexures of the limbs, either in the popliteal space, Scarpa's triangle, or the axilla. Many, but by no means all of them, are associated with injuries. They are far more common in men than in women, but when seen in women they are usually associated with a positive Wassermann reaction, whereas this is by no means always the case in men. Certain aneurysms of this kind are, or have in the past been, associated with certain trades, such as the popliteal aneurysm seen in post-boys, and femoral aneurysm seen in butchers as a result of stabs in the thigh from their knives while sharpening them. Others are seen as a direct or indirect result of surgical procedures; the best known instance of this was the brachial aneurysm in the antecubital fossa which so often occurred as a result of unskilled attempts at bleeding. In the present series there are two instances where the aneurysms can apparently be traced directly or indirectly to surgical operations.

ARTERIOVENOUS ANEURYSMS OF THE CAVERNOUS SINUS

These aneurysms to which I shall first refer are not extremely rare. They are usually the result of severe injury to the base of the skull; quite commonly the cause is a kick by a horse on the jaw, as a result of which a crack runs across the region of the cavernous sinus and a communication is formed between the internal carotid artery and this sinus. Clinically the condition is unmistakable: the patient complains of a continuous loud, roaring noise in his ears, pulsating exophthalmos is present, the eyelids are engorged, purple, and congested with prominent veins, while œdema of the conjunctiva is often present. The characteristic "machinery" murmur, which consists of a loud, continuous roaring or buzzing, increased at every heart beat, can sometimes be heard without a stethoscope, while with a stethoscope it is exceedingly loud, all over the frontal region. It is usually heard loudest over the frontal sinus and eyelid on the side concerned. It may not be easy to settle on which side the aneurysm is until it is noticed that the murmur is stopped more or less completely by compressing the common carotid artery on the affected side, and it is usually made worse by compression on the other side.

Treatment of this condition consists in ligature of the internal carotid artery on the affected side; ligature of the common carotid alone is not sufficient, as the blood will continue to come down the external carotid and go up the internal carotid. Ligature either of both the common and external carotid, or of the internal carotid alone, must therefore be performed. The latter procedure is the best.

The following are 3 out of 5 cases which have been dealt with:—

Case 1.—Male, aged 33. Had been knocked down by a lorry and sustained a fractured base five years before. Pulsating exophthalmos and ulceration of the cornea were marked, while the roaring noise made life intolerable. The noise disappeared on compressing the right common carotid artery, and was made worse by compressing the left artery. Ligature of the right internal carotid artery was performed five years ago, and the noise has completely disappeared. No evil effects followed.

Case 2.—Male, aged 21. Had been kicked on the jaw by a horse three years before. The usual signs and symptoms of this condition had followed, and a ligature of the common carotid artery was performed elsewhere a year afterwards. The patient stated that the noises disappeared in about a week, and then came back again almost as badly as ever. Pulsating exophthalmos was not very obvious; ligature of the internal carotid stopped these noises altogether.

Case 3.—Male, aged 35. Had been kicked on the side of the face by a horse six months before. All the ordinary signs and symptoms were present and the noise could be heard without a stethoscope. Ligature of the internal carotid artery was performed four years ago and the noise has been very greatly diminished, although the patient says it has not quite disappeared.

ANEURYSMS OF THE CAROTID ARTERIES

Idiopathic aneurysms of the common carotid artery are occasionally seen in women, and a large number of them are bilateral. Sometimes they appear to increase in size up to a certain point and then remain more or less stationary. The condition is serious and dangerous if nothing is done for it and causes great discomfort. The following are three interesting instances, the first of which was apparently the direct result of a tonsillectomy probably from bruising or partial damage to the wall of the vessel.

Case 4.—A girl, aged 12, was seen nine years ago with what was supposed to be a gland in the neck. She had had her tonsils and adenoids removed six months before. On examination the swelling was clearly an aneurysm in the neighbourhood of the bifurcation of

the carotid on the left side. It was the size of a large egg and had apparently increased rapidly in size. The Wassermann was negative. An incision was made and the aneurysm was explored. A large sac was found behind the vessel at the bifurcation, more or less wrapped round the common, external, and internal carotid arteries. It was necessary to tie all three vessels before pulsation ceased, while the sac extended too near to the base of the skull for excision to be possible. The child made an uninterrupted recovery though a small, firm, non-pulsating swelling has persisted ever since. This indeed nearly always happens unless the sac of an aneurysm is dissected out.

CASE 5.—Mrs. A., aged 54, was sent to see me with a diagnosis of a large goitre. When she entered the consulting-room a large symmetrical, bilobed swelling could be seen in the neck, looking indeed very much like a huge parenchymatous goitre. On examination it was quite obvious that the swelling consisted of two large symmetrical aneurysms of the common carotid arteries, each the size of a small coconut. The Wassermann reaction was negative and no cause for the condition could be assigned. Ligature of both common carotid arteries was performed with an interval of four months between the operations. No untoward symptoms occurred and all pulsation in the aneurysms has disappeared. The patient is perfectly fit but still has two hard non-pulsating swellings the size of hen's eggs. Recently she has asked me to remove these, but her state is so satisfactory that I am inclined to leave well alone.

CASE 6.—Mrs. B., aged 52, had a positive Wassermann reaction, and a big aneurysm of the left common carotid artery about the size of a very large hen's egg. Here it was possible to ligature the artery above and below the sac and dissect the sac out. This produced a complete cure.

It is noteworthy that in all the above cases ligature of one, or even both, common carotid arteries produced no hemiplegia or other untoward symptoms, but the liability to this and also to gangrene of a limb after ligature of a main vessel is of course much diminished when an aneurysm has been there for some time previously.

INNOMINATE ANEURYSM

CASE 7.—Mrs. C., aged 52, complained of pain down the right arm and up the right side of the neck, and feelings of pulsation in the root of the neck, where a very deep pulsating swelling could just be felt. Radiography showed a round swelling behind the clavicle, and as is often the case it was difficult to feel sure whether the aneurysm was really arising from the innominate, subclavian, or the common carotid vessel. The inner end of the clavicle was dislocated and the sac exposed, where it was found to be an innominate aneurysm. Any attempt to get below the sac appeared to be exceedingly difficult and hazardous, and it was therefore decided to tie the common carotid and subclavian vessels above the sac. No evil results followed, and when seen a year afterwards the patient appeared well, though she complained of weakness and coldness in the right arm.

ANEURYSM OF THE INTERNAL ILIAC ARTERY

The following is an interesting example of another aneurysm which it is difficult not to regard as the result of a surgical procedure.

CASE 8.—A man, aged 47, was brought to me with vague lower abdominal pain, rectal discomfort, tenesmus, and mucus in the stools. On examining his rectum the finger could hardly be inserted as the whole pouch of Douglas was occupied by a huge round, pulsating swelling. This could just be felt in the suprapubic region, and a systolic bruit could be heard. His Wassermann was negative, but he gave a history that three years before he had had an operation for a fistula-in-ano which was followed by very deep and prolonged plugging. This proved afterwards to have been on the same side as the aneurysm, and it is difficult not to believe that the two were connected and that the internal iliac artery had not been bruised or damaged. A laparotomy was performed, and the whole pelvis was found to be occupied by a huge sac. Without much difficulty the internal iliac artery, which was abnormally big, was tied above the sac. No untoward results followed, all pulsation disappeared, and a year after the operation the patient appeared perfectly well.

ANEURYSMS OF THE LIMBS

There is little doubt that the commonest aneurysm in the limbs is the popliteal aneurysm, and the second commonest the femoral. These limb aneurysms arise from a number of causes, in which syphilis and injury play a considerable, but by no means universal, part. Continued flexion movements of joints have always been credited with some effect in the causation of aneurysms, while the lodgment of emboli, usually infected emboli, arising in any of the embolus-forming diseases, is by no means an uncommon cause. In elderly men it is not very rare for one or even bilateral popliteal aneurysms to develop gradually and apparently simultaneously without obvious reason.

FEMORAL ANEURYSMS

Excision of the sac of a femoral aneurysm, though not necessarily difficult, is often rendered more or less impossible either by the actual size of the aneurysm or by its extending very high up, in which case a simple ligature of the femoral or iliac artery, just above the sac, is usually successful in stopping the pulsation, and gangrene is unlikely to occur.

CASE 9.—Male, aged 54. Had had disseminated sclerosis for many years, with much crippling and infection of the bladder. Quite suddenly he started pain in the right groin, and a pulsating swelling rapidly started to form in Scarpa's triangle. Within a fortnight the swelling had become very large, the whole thigh and leg dusky red and œdematous, while the swelling pulsated freely, had a systolic bruit, and extended above Poupart's ligament. Whether this was due to an embolism or not is not quite certain, but the pain was so intense and the aneurysm looked so inclined to burst, or at any rate to leak, that something obviously had to be done for it as soon as possible. The external iliac artery was ligatured by the extraperitoneal method, just above the sac. All pulsation and pain stopped at once and within a few days the swelling had diminished to half its size and had become hard, while the œdema and duskiness of the limb had gone. When the patient left the nursing-home the aneurysm appeared cured.

CASE 10.—Miss D., aged 36, gave a history of ten days' illness with pains in the back and legs, and fever. Four days before a painful swelling had appeared in the left Scarpa triangle, and in the four days this had developed into a large pulsating mass with a systolic bruit which was still increasing rapidly. The heart had a marked mitral murmur, and though it seemed probable that the patient had infective endocarditis, operation appeared urgently necessary. The artery was tied above and below the sac, which was exceedingly adherent. The sac was removed completely, this necessitating removal of a bit of the femoral vein. Healing by first intention occurred and the foot remained quite warm, with good movements. This patient developed hemiplegia six months afterwards and died of infective endocarditis.

POPLITEAL ANEURYSMS

CASE 11.—Mrs. F., aged 25, was admitted six weeks after an apparently septic confinement, with a history of a rapidly appearing, painful swelling in the popliteal space, of a few days' duration. She clearly had a rapidly increasing popliteal aneurysm, while her general condition was good. The sac and artery were exposed, and as it was thought that the condition was probably due to an infected embolus, it was deemed unwise to dissect the sac out, and the artery was tied immediately above the sac. As is often the case in popliteal aneurysms, the condition of the foot gave rise to anxiety for some days, as it remained very cold and blue, but it ultimately recovered, and the patient got about with a weak, but useful, leg.

CASE 12.—Male, aged 70, with atheroma, a low blood pressure, and negative Wassermann. Had had double popliteal aneurysms, one of which extended well up into the thigh, for some years; they were apparently not causing him very much trouble. Early one morning he had sudden pain in the left foot and calf of the leg, while the left foot and leg suddenly became cold, numb, and blue. All pulsation in the left aneurysm ceased. He was brought up to London hurriedly, and it seemed highly probable that an embolus had occurred, and that this could be localised just above the sac of the aneurysm; possibly the clot had swirled up from below. Ten hours after the onset the sac and artery were explored in the hope of removing the clot. The spot where the clot was was easily identified about 1½ inches above the sac; the artery was opened, the clot taken out, and the artery resutured with a watertight suture. Good pulsation returned in the vessel below the suture line; for three days the condition of the foot appeared to improve, but gangrene slowly set in and amputation had to be performed.

This is one of four personal cases of removal of a clot from an artery and suture of the vessel. In two of these the limb afterwards recovered, and in two it became gangrenous.

FEMORAL ARTERIOVENOUS ANEURYSM

Common though arteriovenous aneurysms were during and after the war, they are undoubtedly rare in civil life.

CASE 13.—A man, aged 52, accidentally wounded himself in the left thigh while sharpening a butcher's knife two years before. He had a slight pain in the thigh and a small pulsating swelling could be felt at the centre of Hunter's canal, with a marked thrill and a to-and-fro "machinery" murmur. Very little venous engorgement was present, but the usual cardiac changes seen with an arteriovenous aneurysm—viz., hypertrophy and a systolic murmur—were both observed. Through a long incision over the centre of Hunter's canal the aneurysm was exposed: a small sac was present communicating with both artery and vein; the artery and vein were each tied above and below the communication, and pieces of them, together with the sac, excised. Uninterrupted recovery followed.

OTHER ANEURYSMS OF THE LIMBS

Aneurysms of the smaller vessels of the limbs are by no means uncommon and they are usually the result of trauma, with or without an open wound. In accordance with the general principle already enunciated, the further they are from the trunk the easier they are to cure by operation, and the more likely it is that the radical operation of excision of the sac can be performed. The following are a few instances:—

CASE 14.—A boy, aged 18, had a motor accident and a deep cut on the front of the lower third of the left leg. Two months afterwards he presented himself with a pulsating swelling in this area, about the size of a walnut, and with a systolic bruit. At operation it proved to be saccular aneurysm of the anterior tibial artery which was completely cured by ligature of the vessel and excision of the sac.

CASE 15.—A boy, aged 14, cut his left wrist on some barbed wire and presented himself with a typical arteriovenous aneurysm of the radial artery. There was a pulsating swelling with a thrill and a continuous "machinery" murmur, while the veins round were dilated. Both ends of the artery and vein were tied, and portions of each with the sac were dissected out.

CASE 16.—A girl, aged 20, had stabbed herself in the left forearm with a penknife five weeks before. At the time of admission she had a round, dusky, pulsating swelling near the wound. There was no thrill, but a sharp systolic bruit. The sac was exposed and the radial artery tied above and below it, and the sac then dissected out.

CASE 17.—A girl, aged 18. Since the age of five had had prominent pulsating veins on the back of the right hand and forearm. There was a pulsating swelling over the radial artery at the wrist and another pulsating swelling in the palm of the hand. All the veins of the hand and forearm were congested and pulsating, while there was a thrill and roaring continuous bruit. There was a systolic murmur in the heart, no scar, and no history of injury. Her hand was almost useless. This was thought to be one of the very rare instances of a non-traumatic arteriovenous aneurysm, probably congenital. The radial artery was explored and ligatured above and below the swelling, with a result that pulsation in the veins almost stopped. A year later she stated she was much better, but there was still a large number of pulsating veins and a roaring bruit. The ulnar artery was therefore ligatured just above the wrist. This completely stopped all pulsation and bruit, and the swelling disappeared.

CASE 18.—Mrs. G., aged 50, had for three months noted a small pulsating swelling on the front of the right wrist. She is quite certain there had been no injury. It caused slight pain, had a soft bruit, and was clearly an aneurysm of the radial artery about the size of a large filbert nut. Under a local anæsthetic the artery was tied above and below the sac, and this cured the condition.

The above cases of aneurysms in the limbs exhibit one rather curious phenomenon—namely, that more than half of them were seen in private practice. One would have expected the working-class patient to be the more subject to such injuries.

The important principles in the operative treatment of any aneurysm of this kind consist (*a*) in not using a tourniquet; (*b*) in obtaining complete control of the main artery by exposing this some little way above the sac and placing an arterial clamp, or temporary rubber ligature, on it; (*c*) an attempt should be made if possible to perform a radical excision of the sac. Matas' operations of endo-aneurysmorrhaphy, though excellent in theory, are most difficult to perform in practice. The two instances in which I have attempted it were both failures.

THE USE OF THE COMPLEMENT-FIXATION REACTION IN THE DIAGNOSIS OF HUMAN PSITTACOSIS

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IN the laboratory investigation of a case of suspected psittacosis isolation of the virus should be our principal aim. Virus may be found in the blood or in the sputum and its presence there can be demonstrated by mouse inoculation. Blood is only virulent during the early stages of the disease, whereas the sputum remains virulent over a much longer period and commonly has a higher virus content; it constitutes, therefore, the material of choice (Meyer and Eddie, 1934; Rivers and Berry, 1925). Unfortunately this line of investigation is not always fruitful. Sputum is always scanty in human psittacosis and it may prove impossible to obtain a suitable sample. Further than this, the case may be seen too late for there to be any hope of isolating virus. Hence it is obvious that a serological reaction of diagnostic value would be of the greatest service in the investigation of a case of suspected psittacosis. In a number of virus infections of man neutralising antibody is developed in sufficient

quantity for the neutralisation test to be of use in diagnosis. This is not so in psittacosis (Bedson and Western, 1930; Rivers and Schwentker, 1935), but there is evidence that a specific complement-fixation reaction can be obtained with the serum of individuals suffering from this disease (Bedson, 1933). The probable explanation of these two apparently contradictory observations is that psittacosis virus possesses two antigens each of which excites the production of specific antibody, and that one of these antibodies is responsible for the neutralisation test whilst the other gives the complement-fixation reaction. That a virus may be antigenically complex has been shown in the case of vaccinia (Craigie and Wishart, 1934; Hughes, Parker, and Rivers, 1935) and I have evidence, as yet unpublished, suggesting that the same is true of psittacosis virus. It has now been possible to apply this complement-fixation reaction to a number of sera coming from cases of psittacosis and other conditions and the findings form the subject of this paper.

TECHNIQUE OF THE TEST

The technique is essentially the same as that I use for complement fixation with other viruses and their antisera (Bedson and Bland, 1929). The specific antigen consists of a 5 per cent. suspension of virulent mouse spleen in sterile saline or distilled water, in the latter case made isotonic by the addition of the requisite quantity of 9 per cent. salt solution. Such a spleen suspension when freshly made contains a certain amount of complement and if used in that state will interfere with the accurate dosage of complement in the test. After standing in the refrigerator (± 4° C.) for a week the bulk of the complement will have become inactive and the suspension will then be available for use, but the fresh suspension can be heated for thirty minutes at 56° C. without destroying its specific fixing power. In actual practice this latter mode of treatment has not been resorted to, since spleen suspensions a week or more old were always available.

The keeping power of these antigens varies considerably. Some will retain their antigenic property unchanged for several months, others will have lost it in as many weeks. It is not known what factor or factors are responsible for this, nor is it claimed that the antigen employed is the best that could be evolved; these are points worthy of further investigation. The anticomplementary activity of the antigen is tested on each day of the test and an antigen is only considered suitable if it does not interfere with the action of 1 M.H.D. (minimum hæmolytic dose) of complement when present in double the dose used in the test. A control antigen consisting of a 5 per cent. suspension of either a normal mouse spleen or the spleen of a mouse inoculated with ectromelia virus is invariably incorporated in the test. The serum under examination is used in dilutions ranging from 1 in 1 to 1 in 8, 0·1 c.cm. of each dilution being employed. In addition to the sera under investigation each test includes a known psittacosis serum and two or more normal human sera. All sera are inactivated at 56° C. for thirty minutes. The dose of antigen is 0·1 c.cm. and 2 M.H.D. of complement are used throughout the test. The usual antigen and serum controls are always included and the volume in each tube made up to 0·8 c.cm. with saline. After 2–3 hours' fixation at room temperature 0·2 c.cm. sensitised cells are added and the test placed in the 37° C. water bath for thirty minutes when the first reading is taken. A second reading is made after the test has stood at room temperature overnight.

RESULTS

In Table I. are given the results obtained with the sera from cases in which a confident diagnosis of psittacosis had been made on clinical and epidemiological grounds. With the exception of one case, Pz., the findings obtained with the complement-fixation test are in complete agreement with this diagnosis. It is to be regretted that an attempt to isolate virus was not made in every case but this was sometimes unavoidable. Case M. for instance, a patient in Austria, had no sputum at any time, it was, in fact, this feature of the case which led to a sample of serum being sent in for complement fixation. Of those in which sputum gave a negative result three, Lo., Ba., Sf., were patients in the Allgemeinen Krankenhauses S. Georg, Hamburg, under the care of Prof. Hegler, and the sputum was sent for investigation to the Robert Koch Institute, Berlin. The material from Case L. was examined for virus at the London Hospital.

Table II. records the findings with the sera from a number of cases suspected possibly of being psittacosis. Three of these, from patients W., P., and K., were oxalated plasma and such material is definitely inferior to serum for a finely balanced complement-fixation test such as this. A fairly high degree of non-specific fixation may be given by oxalated plasma as is seen from the findings with these three specimens. In the case of patients W. and K. the interpretation of the test is obvious; it is negative. But in Case P. the interpretation is not so clear. However, although the degree of fixation was greater with the psittacosis antigen with this specimen even with the undiluted serum it was not complete, and since a further reading made later in the disease showed no increase in fixing power, it seems probable that the reading of this test as negative is correct. The serum from Case Bl. fixed complement equally well with both specific and non-specific antigen, and apart from the suggestion that this serum was Wassermann-positive—a point which it was not possible to investigate owing to the amount of serum available—the explanation of this finding is obscure. In the remaining seven cases the interpretation of the test is clear. It should be added that in Case Be. clinical opinion was divided as to the nature of the disease.

The results obtained with a number of control sera are given in Table III. The great majority of these sera were obtained from amongst those sent in for the Wassermann reaction. They were selected after this test had been carried out and those giving a negative reaction deliberately chosen. However, a few positive Wassermann sera were included, since previous experience had shown these to give fixation both with the psittacosis and control antigens.

In no case was the interpretation of the findings with these control sera in doubt. As one might have expected the positive Wassermann sera fixed complement equally well with both antigens, thus revealing themselves and obviating the possibility of their being returned as false positives. They did not all fix complement equally well with these antigens but this was not unexpected; one fixed rather better with the psittacosis antigen than with the control for which it is difficult to assign a reason. It is possible, of course, that, occasionally, a positive psittacosis fixation might be obscured owing to the

TABLE I.—CASES DIAGNOSED AS PSITTACOSIS ON CLINICAL GROUNDS

Case.	Isolation of virus.	Epidemiological evidence.	Day of disease when serum taken.	Complement fixation. Psittacosis antigen. Serum dilutions. 1/2	1/4	1/8	1/16	Control antigen. 1/2	1/4	1/8	Interpretation of test.	Remarks.
H.	Sputum +	Contact with dis. budg.	14th day.	++++ / +++	++++ / ++++	++++ / ++++	.. / ..	− / −	.. / ..	.. / ..	Pos.	—
He.	,,	,,	,,	++++ / +++	++++ / ++++	++++ / ++++	.. / ..	− / −	.. / ..	.. / ..	,,	—
Kl.	,,	Contact with apparently healthy budg.	30th day.	++++ / ++++	++++ / ++++	++++ / +++	.. / ..	∓ / −	.. / ..	.. / ..	,,	—
L.	Blood − Sputum −	Contact with dis. parrots.	18th day.	++++ / ++++	++++ / +++	++ / −	.. / ..	+ / −	.. / ..	.. / ..	,,	Blood only obtained late in disease. Specimen of sputum not satisfactory.
Lo.	Sputum −	Contact with sick budg.	12th and 19th day.	+++ / +++ / ++++ / ++++	++++ / ++++ / ++++ / ++++	++++ / ++++ / ++++ / ++++	.. / .. / .. / ..	+ / ± / + / ±	.. / .. / .. / ..	.. / .. / .. / ..	,,	—
Ba.	,,	,,	.. ..	++++ / ++++	++++ / ++++	++++ / ++++	+++ / +++	+ / ±	± / −	− / −	,,	—
S.	Not done.	Contact with dis. parrot.	Early conv.	++++ / ++++	++++ / +++	++++ / ++	.. / ..	− / −	.. / ..	.. / ..	,,	—
Sf.	Sputum −	Contact with sick budg.	2nd week.	++++ / +++	++++ / ++	++ / −	.. / ..	± / −	.. / ..	.. / ..	,,	—
I.	Not done.	Contact with apparently healthy budg.	3rd week.	++++ / ++++	.. / ..	.. / ..	.. / ..	− / −	.. / ..	.. / ..	,,	Budg. exam. for presence of virus with neg. result.
Ca.	,,	Contact with dis. budg.	,,	++++ / ++++	.. / ..	.. / ..	.. / ..	− / −	.. / ..	.. / ..	,,	Patient bred budg. and 2 died shortly before her illness. These birds were not exam. for virus but stock of breeder, from whom she had obtained birds, was shown to be infected.
M.	,,	Contact with parrots and budg.	30th day.	++++ / ++++	++++ / ++++	++++ / ++++	++++ / +++	+ / ±	± / −	− / −	,,	No sputum obtainable for exam. for virus.
Pz.	..	Contact with dis. budg.	Early conv.	+++ / ++	± / −	− / −	.. / ..	+++ / ++	± / −	− / −	Neg.	Almost certainly case of psittacosis.

TABLE II.—CASES IN WHICH FOR CLINICAL OR EPIDEMIOLOGICAL REASONS PSITTACOSIS WAS SUSPECTED

W.	Not done.	None.	3rd week.	+ / −	.. / ..	.. / ..	.. / ..	++ / +	.. / ..	.. / ..	Neg.	The 3 specimens were oxalated plasma which, though satisfactory in a comp.-fixation test employing a large margin of complement, is not suitable in a finely balanced test such as this one. Although serum from case P gave better fixation with psittacosis antigen than with the control even with undiluted serum fixation was not complete.
P.	Sputum −	,,	12th and 21st day.	+++ / ++ / +++ / ++	++ / + / + / ±	+ / ± / ± / −	.. / .. / .. / ..	+ / ± / + / ±	.. / .. / .. / ..	.. / .. / .. / ..	,,	
K.	,	,,	4th week.	+++ / ++	++ / +	+ / ±	.. / ..	+++ / ++	.. / ..	.. / ..	,,	
Sm.	Not done.	Contact with human case.	6th week.	+ / ±	− / −	− / −	.. / ..	− / −	.. / ..	.. / ..	,,	—
O.	,,	Contact with parrots.	,,	± / ∓	− / −	− / −	.. / ..	± / ∓	.. / ..	.. / ..	,,	Seen only at end of illness. History of severe illness with pneumonic symp. whilst at sea. Contact with parrots during voyage.
A.	,,	Contact with budg.	16th and 26th day.	± / − / ± / ∓	− / − / − / −	− / − / − / −	.. / .. / .. / ..	± / − / ± / ∓	.. / .. / .. / ..	.. / .. / .. / ..	,,	Budg. acquired about 3 weeks prior to illness. Budg. exam. for virus with neg. result. Pt.'s canary died shortly after pt. became ill; no virus found in bird.
B.	Sputum −	,,	17th day.	∓ / −	− / −	− / −	.. / ..	∓ / −	.. / ..	.. / ..	,,	Sputum plentiful, unlike psittacosis; exam. on more than one occasion.
C.	Not done.	None.	36th day.	− / −	− / −	− / −	.. / ..	− / −	.. / ..	.. / ..	,	—
R.	,,	,,	23rd day.	− / −	− / −	− / −	.. / ..	− / −	.. / ..	.. / ..	,,	—
Bl.	,,	Contact with newly bought healthy canary.	30th day.	+++ / ++	++ / +	+ / ±	∓ / −	++++ / +++	+++ / +++	++ / ++	,,	Test done with 3 different specific and control antigens and on each occasion serum fixed complement as well or better with control antigen.
Be.	,,	Contact with virus in lab. work.	19th day, 3rd mth.	++++ / +++ / ++ / +	++++ / ++ / ++ / +	+++ / + / ± / −	+ / ± / − / −	− / − / − / −	.. / .. / .. / ..	.. / .. / .. / ..	Pos.	—

++++ to ∓ represent the degree of fixation. Readings after 30 mins. at 37° C. (upper row) and after standing overnight at room temperature (lower row). Dis. budg. = diseased budgerigars. Conv. = convalescence.

patient's serum giving a positive Wassermann reaction, but this would only lead to a false negative finding.

CONCLUSIONS

The evidence, outlined above, shows that the complement-fixation reaction, when suitably carried out, gives valuable assistance in the diagnosis of psittacosis in man. Six of the sera came from cases under the care of Prof. Hegler in Hamburg and the test was carried out without any further information than that the patients were possibly cases of psittacosis. Comparing the result of the test with the epidemiological findings and his final opinion of these cases clinically, Prof. Hegler has expressed the opinion that the complement-fixation reaction had "ein durchaus sicheres Resultat ergeben." The reaction has been found positive as early as the twelfth day of disease and as late as the fifth week. How long it may remain positive it is impossible to say, but from the findings in Case Be. and from observations made on hyperimmunised guinea-pigs, one would not expect the antibody responsible for this reaction to persist for very long in convalescence. It must be emphasised that the specific complement-fixing power of these human psittacosis sera is of a low order and that in order to detect it a finely balanced test is essential. For this reason rigorous control of the test is essential.

TABLE III.—*Control Sera*

Source of serum.	No.	Result. Psittacosis antigen.	Result. Control antigen.
Wassermann negative ..	33	− / −	− / −
	6	± / −	− / −
	4	± / −	± / −
	4	+ / ±	+ / ±
Wassermann positive ..	3	++++ / ++++	++++ / ++++
	1	++++ / +++	++++ / +++
	1	++++ / ++	++++ / ++
	1	+++ / ++	+++ / ++
	1	+++ / ++	++ / +
Continued fever, ? enteric	1	− / −	− / −
Lobar pneumonia ..	1	++ / +	+ / ±

I wish to thank Prof. C. Hegler, director of the Allgemeinen Krankenhauses, Hamburg; Dr. E. L. Sturdee, of the Ministry of Health; Dr. A. P. Thomson, of Birmingham; and several of my colleagues at the London Hospital for the supply of sera and information from cases of suspected psittacosis.

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ARTIFICIAL PNEUMOTHORAX FOR THE RELIEF OF ACUTE PLEURAL PAIN

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SYMPTOMATIC therapy, so often a faute-de-mieux resource, acquires a biological significance approaching that of specific therapy, when, by increasing subjective comfort it removes, in addition, a pathogenic factor of potential danger to life. This generalisation is aptly exemplified by the successful treatment of pleural pain. In the young and robust, the pain of acute pleural inflammation, because of its agonising character, demands relief primarily on grounds of humanity. In the middle-aged or elderly, however, the onus of therapeutic responsibility is greatly augmented by the probable occurrence of the serious results which commonly follow upon failure to confer subjective relief; for in such patients myocardial failure and death may be sequelæ of the restlessness, insomnia, and anoxæmia occasioned by the respiratory pain, whilst the shallow, pain-inhibited respiratory excursion produces a varying degree of pulmonary basal atelectasis, which is the prelude to pneumonic infection and its satellite toxæmia with a predilection for the myocardium and the medullary centres.

Ideally, rational symptomatic therapy should achieve alleviation of a symptom by nullification or attenuation of the physio-pathological mechanism basic in its production. Scientific accuracy of this order cannot be claimed in regard to the symptom of pleural pain; neither the popular theory of friction between inflamed serous surfaces, nor Bray's [1] concept of parietal pleural elastic tension, is universally applicable. But there remains the universally accepted clinical observation that separation of the visceral and parietal pleural layers, whether by fluid or by air, results, without exception, in the disappearance of the pain of acute pleurisy. The methods generally adopted to relieve pleural pain are (1) strapping the affected hemithorax, (2) the application of counter-irritants, and (3) the exhibition of narcotic-analgesic drugs of the opium or barbiturate group. Attempted immobilisation by strapping is only partially effective, and has the disadvantage that it favours the production of atelectasis; it also hampers consistent clinical and radiological examination. The application of counter-irritants results chiefly in the greasy discomfort of the clinician in charge of the case. The exhibition of narcotic-analgesic drugs is indictable on their inefficacy except in doses capable of inducing cardiomedullary depression which expedites the initiation of anoxæmia, atelectasis, and their attendant ills.

Because of its acknowledgedly complete efficacy in relieving pleural pain, separation of the pleural layers, as by an artificial pneumothorax, seems to be the most rational mode of therapy; its employment, though generally recognised in text-books, is mentioned by them only in terms of curt dismissal. The risk of secondary pleural infection, of causing or increasing myocardial distress, and of superimposing the dangers inherent in the induction of pneumothorax—such as pleural shock and air embolism—appear to be the reasons underlying this attitude. They are more theoretical than experiential, and critical examination reveals them as bogies with a very infrequent incidence and therefore of insignificant import when

balanced against the prophylactic value of efficiently abolishing the anguish of respiratory pain with its clinical consequences.

TWO CASES

The following two cases are cited to support the thesis which has been advanced.

CASE 1.—Mrs. A., aged 58, a week previously had been concussed and had fractured her right clavicle; three manipulations under general anæsthesia had been necessary before the fracture had been set satisfactorily. At noon on the day before I was asked to see her, she felt a sudden, acute pain at the angle of the right scapula; a few hours later she began to cough up bright blood-stained sputum; her temperature rose to 100°, her pulse-rate to 104, and her respirations to 28; pulmonary embolism was diagnosed. She became progressively more ill, and I saw her in consultation with Mr. R. Trevor Jones thirty hours after the onset of her pulmonary symptoms, when the physical findings were: temperature 101° F.; pulse 120, regular, thin; respiration 32; blood pressure 140/80. Moderate cyanosis of lips, malar eminences, and ears. Very restless, delusional, and incapable of rational conversation. Respirations shallow, grunting, and obviously painful. Looks desperately ill. Area of cardiac dullness and heart sounds normal. Diminished movement of right lung base with a large area of dullness, faint bronchial breath sounds, and a pleural rub below the angle of the scapula. Sputum muco-purulent with much bright red blood.

On the history and these findings I concluded that she had developed an atelectatic pneumonia secondary to acute respiratory pain from the pleurisy overlying the area of embolism. It was obvious that the prognosis was extremely grave. Because of the danger of morphia or other narcotic analgesics in adequate doses, to a patient as ill and as old as she, I decided to induce a shallow pneumothorax to relieve the pleural pain, and 250 c.cm. of air were injected without distressing her. The only other treatment prescribed was an expectorant mixture and four-hourly brandy.

Within an hour of the induction her respiratory rate fell from 32 to 20, and she breathed and coughed without distress. Ten hours later—during most of which time she had slept soundly—the clinical picture was surprisingly changed. She was rational, alert, completely comfortable, and not at all cyanosed; her temperature was 100°; her pulse and respiration-rate 94 and 22 respectively. A faint pleural rub had reappeared at the right base, so she was refilled with 200 c.cm. of air. No further refills were given, and, apart from an evening rise of temperature to 99° for three days, she convalesced and recovered completely without incident.

A skiagram of her lungs taken a fortnight later showed pleural thickening at the right base with woolly parenchymal shadowing suggesting unresolved pneumonia. These appearances eventually disappeared completely.

CASE 2.—Mr. B., aged 70, had fractured three lower left ribs 48 hours before I saw him in consultation with Dr. G. N. Grose; for 24 hours he had been coughing and complaining of extreme respiratory pain at the left base. He had suffered from essential hypertension for 18 years and recently had manifested symptoms of myocardial inefficiency. The physical findings were: temperature 99°, pulse 80, respirations 24, blood pressure 170/90 (before this illness usually 200/100). Looks very distressed and ill; slight malar and labial cyanosis. Area of cardiac dullness increased moderately downwards and to the left; mitral first sound prolonged and low-pitched; aortic second sound accentuated. Left base immobile; large area of dullness behind with faint broncho-vesicular breath sounds and a coarse pleural rub.

For 24 hours conservative measures, including diathermy of the chest wall, were resorted to. But his general condition deteriorated and his cardiopulmonary symptoms exacerbated; he was very restless and grossly cyanosed, his breathing was acutely painful, and he had frequent agonising paroxysms of cough which produced purulent nummular sputum; his temperature (morning) was 97°, pulse 120, respirations 36. The physical signs at his left base were unchanged; it was plain that he had developed an atelectatic pneumonia.

The prognosis seemed almost indubitably fatal; narcotic analgesic drugs were definitely dangerous to use. Persuaded by these considerations and by the memory of its therapeutic value in Case 1, I decided to induce a shallow pneumothorax; 250 c.cm. of air were injected. The almost immediate change in his state was spectacular; he breathed and coughed painlessly and his cyanosis became only slight. Eight hours later his temperature was 99° F., pulse-rate 108, and respirations 20; he was breathing and coughing without distress and he was not cyanosed. The prognosis had altered completely. Two hours later and 24 hours after this there was a recrudescence of his previous symptoms, with a rising pulse and respiratory rate and return of a faintly audible pleural rub. On both occasions immediate relief followed a refill with 200 c.cm. of air. No further refills were given. He convalesced rapidly, and his cough and purulent sputum had disappeared by the ninth day of illness.

COMMENT

These two case-histories have many common features. In each case the patient was elderly and had developed an atelectatic pneumonia because of the shallow breathing necessitated by the pain of acute pleurisy coupled with compulsory adoption of the supine posture (vide Briscoe [2]); in Case 1 the correctness of the diagnosis was supported radiologically; in both cases the anoxæmia consequent upon shallow breathing and partial pulmonary atelectasis, added to the toxæmia of secondary pneumonic infection, compelled a prognosis of death from cardiomedullary depression. But in both cases the induction of a shallow pneumothorax produced a dramatic metamorphosis of the clinical and prognostic picture, by its relief of respiratory pain, and so of the anoxæmia and atelectasis; moreover, in each case the amount of air sufficient to give relief was too small to be capable of causing myocardial embarrassment. The employment of artificial pneumothorax for acute dry pleurisy has theoretical sanction because of its accepted efficacy in removing the respiratory pain, especially since it thus minimises the possible sequential dangers facing the patient. The two cases detailed show that this theoretical sanction is supportable by practical experience.

The general circumstances indicating the therapeutic employment of pneumothorax for pleural pain have been considered. In post-operative cases in which an abdominally initiated diaphragmatic paralysis enhances pulmonary basal atelectasis its value seems worthy of further research. Coghlan [3] in this country and many foreign observers have advocated lung collapse for the treatment of lobar pneumonia; but despite the striking support given to them by the experimental studies of Lieberman and Leopold [4] their advocacy has not found general favour, chiefly because of a theory based clinical timidity. Whatever the theoretical objections to the induction of major lung collapse in lobar pneumonia, there can be few or none to a consideration of the pain-removing, comfort-giving injection of the innocuously small amount of air necessary to produce pleural separation in those early days of the disease in which the ultimate prognosis is influenced by the degree of general and myocardial exhaustion to which the patient is subjected. Taylor [5] has testified in support of this contention.

SUMMARY

1. The pain of acute dry pleurisy demands removal in young patients on humane grounds; in the elderly

this is imperative as a prophylactic measure against the occurrence of anoxæmia and atelectatic pneumonia which is so often fatal.

2. The therapeutic methods in general use are either only very partially effective or dangerous.

3. The induction of a shallow pneumothorax invariably relieves pleural pain and so removes anoxæmia and atelectasis. The amount of injected air necessary is so small as to be quite harmless.

4. Two cases are detailed in which atelectatic pneumonia and anoxæmia, secondary to pleural pain, suggested a fatal prognosis. Dramatic recovery followed the induction of an analgesic pneumothorax.

5. The indications for the employment of pneumothorax to relieve acute pleural pain are discussed.

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ARTIFICIAL PNEUMOTHORAX IN THE MANAGEMENT OF LOBAR PNEUMONIA

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PNEUMOTHORAX as a spontaneous disease has been recognised definitely since the time of Riolan [1] (1648). The first purposeful attempt experimentally to produce pneumothorax in animals is ascribed to Hewson [2] (1767). Forlanini [3] is credited as the first to employ artificial pneumothorax clinically in 1882. The application of this procedure as a therapeutic measure in pneumonia was due to Friedemann [4] in 1921, but the appearance of Coghlan's [5] paper in 1932 served to reawaken interest in this measure. In 1932 two cases of lobar pneumonia were given artificial pneumothorax in my service at the Philadelphia General Hospital, and in 1933 I suggested a more extensive clinical application. About this time Liebermann and Leopold [6] reported their experimental studies upon dogs with induced pneumonia, including one case of lobar pneumonia in a man aged 44, who responded promptly and favourably to artificial pneumothorax. They were able to collect no more than 50 cases reported in the literature before 1934, with 47 recoveries and 3 deaths. Many of these cases were children in whom mortality from lobar pneumonia is admittedly low.

At the Philadelphia General Hospital (of 2500 beds) we deal with the poorer strata of society, among whom ignorance, neglect, and economic stress are perennial. The mortality-rate in lobar pneumonia under such conditions must be high. Hence our desire to observe the effect of artificial pneumothorax. This was administered to 47 cases: 27 whites with a case-mortality of 37 per cent., 20 negroes with one of 50 per cent. mortality, total death-rate 43 per cent. The number of refills varied from two to eight, an average of 400 c.cm. being given each time. We carefully avoided the induction of a positive pressure, although there is some evidence in support of that as a preferable procedure. Under the conditions as stated, we never observed any influence upon venous pressure, determined intravenously, and no appreciable influence upon the blood pressure.

Summarising our 47 cases, there were 39 males and 8 females, ranging in ages from 23 to 65 years, and one case 15 years of age. Twenty-four were admitted from the fourth to the sixth day of the disease, nine at an indefinite period, ten on the second day, and four on the first day. The types were 1 and 2 and group IV. Only one developed empyema. Several had an effusion, but in no instance could fluid be ascribed to the pneumothorax. Three died in less than twenty-four hours after admission. One of these, a negro, aged 26, was found post mortem to have nephrotic kidneys and fatty degeneration of the liver. The only one to develop empyema was a white man of 46 who had a mitral regurgitation, an enlarged liver, a 4 plus Kahn, also 4 plus with all antigens. He was a type 1. He recovered from pneumonia, but died three months and nine days after admission, having undergone several operations for empyema. A luetic negro of 32 had hypertrophy of the left ventricle and vascular disease, and had been ill for two weeks before admission. He died four days later.

In a previous paper Dr. H. F. Robertson and I [7] called attention to lues as a factor in unresolved pneumonia. What influence syphilis has upon the course of pneumonia I am unable to state. Several of our fatal cases were syphilitic, but some of those who recovered also had strongly positive Kahn and Wassermann reactions. However, the influence of this infection in causing delayed resolution in pneumonia seems definite, though no case presented among the pneumothorax group.

One very obese, white man of 26, a post-encephalitic with a Parkinson syndrome who had had bulimia and still had polydipsia and polyuria, died on the fifteenth day of the disease, seven days after admission. Two had fibrillation on admission. One of these was jaundiced. One negro of 54 had been ill in bed four weeks, attended only by neighbours before admission. He had a right upper lobe lesion when brought in, but he died of a pneumococcus meningitis (group IV.) sixteen days after admission. A white man, aged 65, an indigent, had been ill for five days in the city shelter and died two days after admission.

If we exclude the ten cases briefly referred to above, there remain 37, with 10 deaths, a mortality of 27 per cent. This seems justifiable. It was less an error of judgment in including them originally than a desire to study the effect of artificial pneumothorax on all of the cases of lobar pneumonia admitted to the wards in a certain period of time. Many of the cases reach our institution after suffering more or less neglect and privation. Selection of cases may seem more appropriate than the elimination of those manifestly unfit for any reason. In omitting ten of the series, we have, at the same time, endeavoured to portray the results obtained under both conditions. We are continuing our observations. A much larger experience will be necessary before a really valid opinion can be expressed, despite the strikingly favourable results obtained by Lieberman and Leopold in experimentally induced pneumonia in dogs.

Although theoretical arguments might be marshalled, we have not been able to conclude that pneumothorax is of real practical value in the treatment of pneumonia. It does confer almost instant relief upon those suffering from coincident pleuritis, but it does not cut short the attack of pneumonia. Frequently, too, it ameliorates cough and expectoration. It seems equally definite that it is innocent of any collateral ill-effects. It frequently lowers the temperature level, sometimes to a surprising extent, and when marked the fall is accompanied by profuse

sweating. These pseudocrises are less uniformly accompanied by a subjective sense of well-being than one sees when a foreign protein is given by vein, especially when a protein shock reaction is given before the end of the third day of pneumonia. In both instances, however, the physical signs pursue an uninterrupted course.

The scope of this paper precludes more than a brief reference to the Schilling count. Dr. Walter Crocker and Dr. Eleanor H. Valentine, the latter a former interne at the Philadelphia General Hospital, have added materially to the Schilling method and extended its usefulness by what they have termed the shiftogram; of evil portent is a sharp shift to the left, when both myelocytes and juveniles escape into the blood stream. It only remains for me to add that a careful study of the staining properties and the architecture of the leucocytes often furnishes a basis of prognostic value.

I desire to extend my sincere appreciation to my colleagues on the medical staff for permission to include their cases, to Dr. John A. Wagnetz and to Mrs. Wagnetz for their aid in the compilation of statistical material, and to my internes, Drs. Roscoe B. G. Cowper, Albert Behrend, and Vernon L. Tuck for their untiring efforts.

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HUMAN ANTHRAX IN BAROTSELAND TREATED WITH NOVARSENOBENZENE

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HUMAN anthrax is a comparatively rare disease; it is more or less confined to certain localities, and to a certain section of the population. The pustular lesion, on both white and black skins, is very characteristic, and once seen will never be mistaken for anything else.

Among the cattle-owning Marozi natives of Northern Rhodesia, especially among those who live in the upper Zambesi valley (Barotse plain) anthrax is not uncommon, and has a high fatality-rate. These natives live with their cattle out on the plain during the dry season, June to December, and as the flood waters of the Zambesi gradually inundate the plain, so the natives retreat with their cattle to the higher bush country. The spores of *Bacillus anthracis* must be present in the soil of the plain, where the cattle have grazed for years, and with the advent of the rainy season, conditions for the germination of these spores are favourable; cases of anthrax, both human and bovine, occurring after the commencement of the rains. Human infection is almost always due to the use of infected hides as clothing or bedding; the spores remaining quiescent until the advent of the favourable rainy season conditions.

It is difficult to substantiate the natives' reports, but, as far as can be gathered, during December, 1933, and January, 1934, there were 25–30 cases of human anthrax within a radius of 20 miles of Mongu, the administrative centre of Barotseland. It was said that almost every patient died, and we may take it that the mortality was over 60 per cent. The disease was of the "malignant pustule" type, but it was learned on questioning that there had also been several deaths from what appeared to be an acute hæmorrhagic gastro-enteritis, death invariably occurring within 24 hours of the onset. These were quite probably cases of intestinal anthrax, due to ingestion of infected meat.

In January, 1934, an outbreak of what turned out to be anthrax was reported by one of the petty chiefs, and instructions were given that all human cases were to be brought into hospital; while instructions with regard to the control of the disease in the affected village were also issued. Previously no cases of anthrax had been treated in hospital, nor, so far as can be ascertained from past records, had they been seen or diagnosed by the medical officer, stationed at Mongu.

Four cases of anthrax were brought to hospital during the months January–April, 1934, and 5 more during the months December, 1934–February, 1935. These 9 cases were all treated in Mongu Hospital. In each of them smears were made from the fluid in the surrounding vesicles, or if these had coalesced with the central slough, then from fluid aspirated from the tissues underlying the slough; these smears were stained with Gram's stain and all showed *B. anthracis*, scanty in some, profuse in others.

The only treatment given, apart from boric fomentations locally, was novarsenobenzene (neoarsphenamine) intravenously, or a similar preparation, sulpharsenobenzene (sulpharsphenamine) intramuscularly. One injection of 0·6 g. was usually found sufficient, but if the œdema persisted after 24 hours a second was given. In every case this œdema—which had been severe and likely to cause death in 3 of the patients—was relieved in 36 hours, and had disappeared in four days. The temperature subsided, after an initial rise, and was normal in five days. Clinically all the cases (except No. 5, one of the two which proved fatal) were much improved in 24 hours, and apart from the resulting ulcer, with its sloughing centre, the 7 patients who recovered were perfectly fit and ambulatory on the sixth day. After the slough had separated, the ulcer was covered with adhesive plaster and left for a week; the plaster was then renewed, and at the end of three weeks or a month the patient was discharged with a pink though rapidly browning scar.

THE NINE CASES

CASE 1.—Female, aged 16. First seen and admitted to hospital on Jan. 6th, 1934. Pustule of two days' duration, situated over the right scapular region. The black centre of the pustule was ¾ in. in diameter; there was a surrounding erythematous zone with vesicles containing yellowish fluid, and a brawny œdema extending 3 in. from the centre of the pustule. Films made from the fluid in the vesicles showed *B. anthracis*, mostly in short chains of three or four bacilli. On admission the temperature was 100·2° F.; pulse-rate, 96. Neokharsulphan 0·3 g. was given intramuscularly, the dose being repeated on Jan. 7th. Œdema was considerably less on the 8th, but the temperature was still 100°. After injection of novarsenobenzene 0·3 g. intravenously on the 9th there was no further rise of temperature, and the œdema was gone by the 10th. No more treatment was given except the application of adhesive plaster to the resulting ulcer, after the separation of the slough on Jan. 12th. The ulcer healed by the 25th and the patient was discharged.

CASE 2.—Male, aged 18. First seen and admitted to hospital on Jan. 12th, 1934. Anthrax pustule of three

days' duration, situated on the left side of the face over the angle of the jaw; much œdema, especially of the neck, causing respiratory embarrassment. Temperature, 102·6°; pulse-rate, 110; respirations, 35. Scanty *B. anthracis* present. On Jan. 12th novarsenobenzene 0·6 g. was given intravenously. On the 13th œdema was much less; temp., 102·4°; pulse, 90; resp., 25. On the 14th œdema was again less; novarsenobenzene 0·3 g. was given intravenously. By the 15th œdema had gone (temp., 99·8°; pulse, 80; resp., 18) and on the 16th the patient was quite fit, save for a sloughing ulcer at the site of the pustule. Plaster applied over ulcer on Jan. 19th and the patient was discharged on Feb. 9th with the ulcer fully healed.

CASE 3.—Male, aged 15. First seen and admitted to hospital on Feb. 3rd, 1934. Anthrax pustule of two days' duration near the outer canthus of the left eye, which

23.iv.34 8.v.34
Photographs of the patient in Case 4 showing cure of large anthrax pustule on right cheek.

was quite closed by œdema extending all over the left side of the face and neck. Temperature, 104°; pulse-rate, 120; respirations, 32. *B. anthracis* plentiful in fluid from vesicles. On Feb. 3rd novarsenobenzene 0·6 g. was given intravenously. Next day the œdema was much less (temp., 101°; pulse, 84; resp., 20) and on the 5th it had almost gone (temp., 99°). By the 6th there was no œdema and the patient was quite fit. Plaster was applied on the 11th and he was discharged, with the ulcer healed, on the 24th.

CASE 4.—Male, aged 17. First seen on April 23rd, 1934. Anthrax pustule of three days' duration situated near the outer canthus of the right eye (Fig. 1). Much œdema of the eye, face, and neck; vesicles surrounding the pustule beginning to break down. Temperature, 101°; pulse-rate, 90; respirations, 28. *B. anthracis* scanty in scrapings. This patient had novarsenobenzene 0·6 g. intravenously on the 24th, and by the 26th his œdema had gone and he was quite well. On May 1st plaster was applied to the ulcer, and on the 20th the ulcer had healed and the patient was discharged. Fig. 2 shows the condition on May 8th.

CASE 5.—Male, aged 1 year. First seen and admitted to hospital on Dec. 7th, 1934, with an anthrax pustule of five days' duration situated on the chest near the left breast. The child was obviously very ill; temperature, 100; pulse-rate, 160; respirations, 40. *B. anthracis* was present in tissues round the pustule, and there was considerable œdema of the chest wall. No veins could be located, so sulpharsenobenzene 0·15 g. was given intramuscularly. The child died three hours after admission. No post-mortem was allowed by the parents, but death was obviously due to toxæmia.

CASE 6.—Male, aged 5. First seen and admitted to hospital on Dec. 19th, 1934, with an anthrax pustule of two days' duration situated on the left side of the neck; much œdema of the neck and chest wall. Temperature, 101°; pulse-rate, 140; respirations, 36. *B. anthracis* very plentiful in the surrounding vesicles. On Dec. 19th novarsenobenzene 0·3 g. was given intravenously. Next day the œdema was less, but the temperature was up to 103·8°; so a further 0·3 g. was given intravenously. On the 21st the child was much better (temp., 99°; pulse, 100; resp., 30). On the 22nd however he developed abdominal ascites which increased until the abdomen was greatly distended. Weakness increased and death occurred on the evening of the 23rd. Possibly the ascites was due to overdosage with N.A.B. There was no jaundice. No post-mortem was allowed.

Following closely on Case 5, which was rapidly fatal owing to treatment being so long delayed, Case 6 was unfortunate. It was thought wise to give massive treatment before the toxic effects of the disease had got the better of the child's constitution, but this child might have recovered if the second dose of novarsenobenzene had not been given.

CASE 7.—Male, aged 25. First seen and admitted to hospital on Dec. 29th, 1934. He had two anthrax pustules, one of two days' the other of three days' duration; one was situated on the right side of the face on the angle of the jaw, the other on the left side of the forehead. There was a great deal of œdema, especially on the right side of the neck, causing difficulty in breathing. Temperature, 100°; pulse-rate, 130; respirations, 30. The first dose, on Dec. 29th, was novarsenobenzene 0·6 g. intravenously; the temperature rose to 103° that evening, but the pulse-rate dropped to 120. On the 30th the œdema was less (temp., 101°; pulse, 100; respirations easier). Next day the œdema was less again (temp., 99°; pulse, 90). By Jan. 1st all the œdema had gone; the temperature was normal and the pulse-rate 84. On the 2nd the patient was quite well and the sloughs separating. Plaster was applied to both residual ulcers on the 5th, being removed and reapplied on the 15th. The ulcers had healed on discharge on the 28th.

CASE 8.—European male, aged 40. First seen on Jan. 30th, 1935. Large anthrax pustule of three days' duration on the flexor aspect of the left wrist. This trader owns and handles numbers of cattle, and each year loses a few from anthrax; though he did not suspect that this "sore" was anthrax. He was treated as an out-patient. When he was first seen the temperature was 102° and the pulse-rate 110; there was considerable œdema extending from the wrist and hand to the shoulder, but no axillary adenitis. On Jan. 30th he had novarsenobenzene 0·6 g. intravenously, and on the 31st the œdema was reduced though the temperature was up to 102·4°; pulse-rate, 104. On Feb. 1st a further intravenous injection of 0·6 g. was given and by the 3rd the œdema had gone and the temperature and pulse were normal. Plaster was applied on Feb. 8th and the ulcer had healed by March 5th.

CASE 9.—Female, aged 50. First seen and admitted to hospital on Feb. 5th, 1935. There was an anthrax pustule of two days' duration on the left side of the neck; also a great deal of œdema around the neck and on the left side of the face. Temperature, 102°; pulse-rate, 110. She was given novarsenobenzene 0·6 g. intravenously on Feb. 5th and the œdema was almost gone by the 7th, the temperature being normal. Œdema had disappeared on the 8th and the patient was fit, save for the resulting ulcer. Plaster was applied to it on the 11th and renewed on the 20th. The patient was discharged on March 2nd, the ulcer having healed.

RÉSUMÉ

Nine patients with pustular anthrax were treated with novarsenobenzene (neoarsphenamine) only. Seven of them made remarkable recoveries; the other two, aged 1 year and 5 years, died. The first of these, Case 5, was only brought to hospital on the sixth day of the illness, and was moribund on admission. The second, Case 6, responded to

the second dose of novarsenobenzene, but developed a fatal ascites probably due to the toxic effects of this drug on the liver. The number of cases is too small to allow of comparison with other methods of treatment, but the results suggest that novarsenobenzene, if given within four days of the appearance of the pustule, will almost certainly cure the disease.

I am indebted to the acting director of medical services, Northern Rhodesia, for permission to publish this paper.

TREATMENT OF HÆMORRHAGIC DISORDERS WITH VITAMIN C

By H. Engelkes, M.D.

It is only a few years since Szent-Györgyi isolated ascorbic acid (vitamin C) in crystalline form, and most attempts to use this substance in clinical practice have been concerned with scurvy, which is due to a primary deficiency of the vitamin. If the administration of pure ascorbic acid were limited to this condition we should not often need to use it, especially as fresh fruit juices already provide a remedy. But the real importance of Szent-Györgyi's discovery, from the clinical standpoint, lies in its application to so-called conditioned scurvy. One speaks of a conditioned deficiency when an intake of vitamins sufficient for a normal person proves insufficient because of abnormal conditions in the body. These conditions may be very various, including inadequate absorption, destruction by intestinal bacteria or by a general infection, and perhaps too rapid excretion by the kidneys. Endocrine disturbances also may sometimes play a part.

We are only at the beginning of our knowledge of this conditioned scurvy, and we owe a debt to Stepp and his co-workers who have given an impetus to its clinical investigation. At the Congress of Internal Medicine at Wiesbaden in 1934 Stepp,[1] after pointing out that the typical symptoms of frank scurvy are hæmorrhages and alterations in the bones and teeth, reported results he had obtained at Munich by the treatment of other hæmorrhagic disorders with ascorbic acid. His co-workers, Böger and Schröder, had observed that in such disorders the amount of plasma protein is decreased, the decrease being greater in the albumin than the globulin; in other words, the albumin-globulin ratio is lower than normal. When ascorbic acid was injected the findings were reversed, and this led them to give ascorbic acid to a patient with hæmaturia, with the result that it disappeared at once. The same favourable effect was seen in a case of Henoch's purpura. Stepp also pointed out that the oral administration of the vitamin sometimes does not help either because it is disintegrated in the small intestine, or because in these patients absorption is interfered with.

In August, 1934, Böger and Schröder[2] reported fresh discoveries. They succeeded in stopping alarming intestinal hæmorrhages in a patient with hæmophilia; and in a case of essential thrombopenia, two days after injections began, they saw the skin and mucous membrane hæmorrhages stop, the urine being free from blood another two days later. The bleeding-time was reduced, the thrombocyte count rose, and the protein content and albumin-globulin ratio of the plasma were increased. Hæmorrhage stopped long before the number of blood-platelets rose appreciably, and from this it could be deduced that reduction in platelets is not the only decisive factor in the causation of hæmorrhages—others perhaps being alterations in the plasma or in the permeability of the capillary walls. Lastly, they suggested that in bleeding from other causes (icterus, hæmorrhages from uterus, stomach, or kidney) ascorbic acid might be of service.

Shortly afterwards I was in the position to treat a serious case of essential thrombopenia successfully by this method,[3] while Vogt[4] has reported good results both in thrombopenia and in gynæcological hæmorrhages. Having since had further success in cases of hæmorrhagic disorder, I propose to report them briefly. The three summarised below were seen in private practice and form an unselected series.

Description of Cases

I. ESSENTIAL THROMBOPENIA *

A woman 64 years old, operated on ten years ago for stone in the ureter and now suffering from gall-stones, was troubled in February, 1934, with profuse nose-bleeding, for which the rhinologist could find no local cause. The blood was not examined and after a few weeks the bleeding ceased, only to return, however, in November, 1934. She then had gall-stone colic, and a week later skin hæmorrhages and sore spots in the mouth; on Dec. 13th hæmaturia and melæna began. When I saw her on Dec. 17th the skin showed hæmorrhages of various sizes and forms: there were petechiæ, ecchymoses, bruises on the neck, face, and extremities, and to a less extent on the trunk. The inside of the cheeks, the palate, and the underside of the tongue also showed blood effusions. In the mouth there were here and there superficial epithelial defects. There were no hæmorrhages in the fundus oculi and the vitreous. The urine seemed to be pure blood; it did not contain any glucose in demonstrable amount. The fæces were tarry.

The liver and spleen could not be felt. The region of the gall-bladder was tender to pressure. The temperature did not rise higher than 37·8° C. (100° F.) rectally. The blood pressure was 270 systolic and 130 diastolic. Blood examination: hæmoglobin 90 per cent., erythrocytes 4,700,000, leucocytes 6000, thrombocytes 3000, bleeding-time (Duke) 10 minutes. In the blood smear no blood-platelets were seen, only some large forms of thrombocytes. For the rest no abnormalities were found in the blood film. The blood-clot did not contract in the least. Plasma proteins: albumin 3·67 g. per 100 c.cm., globulin 1·65 g., albumin-globulin ratio 2·22. Wassermann reaction negative.

Course of Case I

Date.	Bleeding-time.	Thrombocytes	Albumin. (g. per 100 c.cm.)	Globulin. (g. per 100 c.cm.)	Alb.-glob. ratio.	Treatment.
Dec. 14	10 min.	3,000	3·67	1·65	2·22	150 mg. cebion.
,, 19	6 ,,	—	—	—	—	150 mg. cebion.
,, 21	3 ,,	12,000	—	—	—	150 mg. cebion.
,, 24	1½ ,,	56,400	3·80	1·65	2·30	150 mg. cebion.
,, 27	1½ ,,	360,000	—	—	—	200 g. orange juice.
Jan. 4	1½ ,,	316,000	4·16	1·70	2·45	200 g. orange juice.

The diagnosis was acute exacerbation of chronic essential thrombopenia, hypertension, and cholelithiasis. The very high blood pressure was a contra-indication to splenectomy; for when a splenectomy has unfavourable results, it is often due to circulatory disturbances. Hence it was decided to commence treatment with vitamin C. Ascorbic acid (in the form of Cebion, Merck) 150 mg. a day was injected intravenously and the result was surprising (see accompanying Table). After only two days' treatment there were no new hæmorrhages in the skin

* This case has already been reported.[3]

and mucous membranes, though the urine still contained much blood. After four days the urine was very much clearer, the bleeding-time had fallen to 3 minutes, and the number of blood-platelets was only 12,000. After six days the urine was clear, and after seven days it contained no albumin and the sediment no erythrocytes. The bleeding-time was now 1½ minutes, the number of thrombocytes being 56,400; in the incubator the blood-clot retracted after 15 minutes. Meanwhile the blood pressure had dropped to 180 mm. systolic and 80 mm. diastolic. After nine days the number of blood-platelets was 360,000, and during the rest of the time the patient was under observation this figure remained the same, while the bleeding-time remained about 1½ minutes.

After cebion had been given intravenously for ten days, it was stopped and 200 c.cm. orange juice was given by the mouth. This contains about 100 mg. ascorbic acid, whereas according to Szent-Györgyi a grown-up person only needs about 50 mg. a day. Later in the illness the patient had another attack of gall-stones; the temperature rose to 38·3° C. (100·9° F.) rectally and there was a trace of bilirubin in the urine. This attack passed after two days; she was given Urotropine and the temperature became normal. In order to prevent a relapse of the hæmorrhagic condition I went on giving ascorbic acid orally and the patient took a few oranges every day or tablets of ascorbic acid. She is now apparently well.

Certain observations may be made on this case. (1) Although spontaneous recovery is a possibility, it is remarkable that after two days no new hæmorrhages occurred and after six days the urine contained no more blood. (2) The very long bleeding-time (10 minutes) fell within a few days to 3 minutes, and after seven days to 1½ minutes, remaining as short as that after the medicament had been stopped for several weeks. (3) The number of blood-platelets rose in ten days from 3000 to 360,000. (4) After only a few days the blood-clot retracted normally. (5) During treatment the high blood pressure fell considerably, but one cannot say how far the fall is permanent or due to the vitamin treatment. Ascorbic acid—but only in very large doses—is said to reduce the blood pressure of animals.

II. PURPURA INFECTIOSA

A boy, aged 15, became acutely ill on March 10th, 1935, with high temperature, headache, joint pains (especially in elbows and knees), and vomiting. Further there was purpura over the whole body, chiefly on the extremities and abdomen, but also on the face; on the thighs were large ecchymoses. He had epistaxis but no bleeding of the gums, or hæmaturia, or melæna, or sore-throat. He was continuously delirious, had incontinence of urine and fæces, and a rectal temperature of 40° C. (104° F.). The pulse was small and its rate 140. The lymph glands were not swollen, and there was no œdema. No abnormalities were found in heart or lungs, and the spleen and liver were not palpable. The left knee was much swollen with effusion of fluid, and very painful, several other joints being also affected. The urine contained a trace of albumin and hyaline casts; no sugar and no blood-cells. Blood: hæmoglobin 85 per cent., erythrocytes 4,200,000, leucocytes 14,000, thrombocytes 128,000, bleeding-time 3 minutes, morphological picture normal.

Cebion 150 mg. was given intravenously each day, and after three days, though the temperature was just as high, no new hæmorrhages appeared and the old ones were quickly absorbed. The general condition was much better. The boy complained, it is true, of pain in the joints, but he had become psychically normal and the incontinence and vomiting had stopped. After that the vitamin was given by mouth (150 mg. daily). At the same time 2 g. of aspirin a day was administered. The temperature dropped during the following days, the joints gradually became less painful, and after four weeks the patient had recovered and was discharged.

This was a serious case of purpura infectiosa, in which the hæmorrhagic manifestations disappeared and the general condition improved under treatment with vitamin C. The fever and polyarthritis, however, were not noticeably influenced.

III. ESSENTIAL HÆMATURIA

A woman of 23, before her illness a nurse, has the following interesting history. Up till Nov. 28th, 1932, she was healthy, but then she suddenly developed hæmaturia; the urine seemed to be pure blood. This condition lasted a week after which the hæmaturia almost (but not quite) disappeared. She had some hæmaturia up to March, 1935—i.e., for 2½ years; though its intensity was very variable blood could always be seen under the microscope, and there were several serious attacks (Nov. 28th to Dec. 5th, 1932; August 11th to 25th, 1933; April 17th to the middle of June, 1934; Dec. 4th to 18th, 1934; Jan. 30th to middle of February, 1935; and March 1st to 15th, 1935). As I have said, these attacks were merely the exacerbation of a continual hæmaturia lasting 2½ years. In the course of this time she had right-sided pleurisy, lasting about five weeks, and radiograms taken afterwards showed a decreased mobility of the right half of the diaphragm, and an old tuberculous focus in the middle lobe of the right lung. Because of this pleurisy she spent the first half of 1934 in a sanatorium, and there she had an "attack" of hæmaturia lasting two months. Menstruation was normal all the time, and she never had bleeding from the nose, gums, skin, or intestines.

Repeated urological examinations were made, both during and between attacks of hæmaturia, and no abnormalities were ever seen in the bladder wall; no tuberculosis, no papillomata, and no stones. Out of both the ureters spouted urine containing blood but free from tubercle bacilli or other bacteria. Indigo-carmine was excreted on the left side after 8 minutes, and on the right side after 10 minutes. During the attacks the urine from both ureters looked like pure blood. The pyelogram was normal on both sides, and no stones were visible. The patient had always taken fruit and vegetables in the food; she had never had a special diet, so that there was no question of a primary deficiency.

She was admitted to hospital on March, 4th, 1935, during an attack of hæmaturia. She looked quite healthy and physical examination revealed no abnormalities in heart, lungs, or other organs, apart from the limitation of movement of the lung border on the right side, due to the pleurisy. The urine contained much blood, and no sugar; the blood-urea was 35 mg. per 100 c.cm.; Ambard's constant was 0·08 (normal); and the dilution- and concentration-power of the kidney was normal. Blood: hæmoglobin 100 per cent., erythrocytes 5,500,000, leucocytes 6000 (normal formula), thrombocytes 487,000, bleeding-time (Duke) 1 minute. Plasma proteins: albumin 3·98 g. per 100 c.cm., globulin 2·14 g., ratio 1·85.

A diagnosis of essential hæmaturia was made and the patient was given ascorbic acid intravenously (Redoxon, Hoffmann-La Roche); during the first six days she had 100 mg. daily and after that 200 mg. in single doses. During the first six days the decrease of blood in the urine was scarcely perceptible; but after that the hæmaturia quickly diminished, and after ten days no erythrocytes could be found microscopically in the sediment. The albuminuria, however, had not yet disappeared. Redoxon was given intravenously for a further six days, and then in doses of 200 mg. a day orally till May 25th; after that she had 100 mg. daily by mouth. No more erythrocytes were found on microscopical examination of the urine except on one occasion after a wound with the catheter. The albuminuria had soon disappeared. For the sake of certainty she is still taking 100 mg. ascorbic acid daily by mouth to prevent a relapse; but after 2½ years' invalidism she is now once more fit for work.

Summary

In the above cases the favourable results obtained in Stepp's clinic were repeated. In none of them was any remedy given apart from ascorbic acid, except in Case III., where the patient had salicylates after the hæmorrhages had disappeared. In all three

cases the administration of ascorbic acid was followed by rapid improvement, and it caused no unpleasant symptoms.

Additional Note

I have since seen two other cases in which the same treatment proved successful.

A woman of 70, who suffered in 1932 from carcinoma of the uterus, was irradiated for that reason with radium. She recovered and was in good health up to June, 1935. She then had an *intensive hæmaturia* and *several ecchymoses* (some the size of a fist) on the legs. Rumpel-Leede's sign was positive. Physical examination revealed no abnormalities in the chest or abdomen. The blood pressure was 190 systolic and 100 diastolic. Cystoscopy revealed no alterations of the bladder, and no stones were seen on radiography. The urine contained neither tubercle bacilli nor other germs. Blood: hæmoglobin 80 per cent., red corpuscles 4,200,000, leucocytes 4500 (normal formula), platelets 84,000, bleeding-time three minutes. Wassermann reaction negative. The blood-urea was 90 mg. per 100 c.cm. A moderate thrombopenia, combined with arterio-sclerosis, had probably caused this hæmorrhagic condition, and the patient was given 200 mg. redoxon daily. After two days no new hæmorrhages appeared; after four days the urine became much clearer, and after six days the sediment contained no more erythrocytes. For several weeks she took ascorbic acid by mouth (100 mg. daily), and there was no further hæmaturia or other hæmorrhage.

The fifth patient was a man of 62, operated on for lateral inguinal hernia. After operation a large blood effusion was present under the skin, along the right side of the abdomen and the leg and under the skin of the penis. After absorption of this effusion the wound did not cease to bleed, and the surgeon injected calcium, Coagulen, &c., without any perceptible result. When three weeks after the operation the wound was still bleeding I was asked to see the patient. He proved to be a drunkard and had *cirrhosis of the liver*. This organ was enlarged and firm, and in the urine was a trace of bilirubin. A daily dose of 200 mg. redoxon was given intravenously, and after 48 hours the bleeding had totally ceased.

The five patients of this series had capillary hæmorrhages. Where the hæmorrhage is venous or arterial—e.g., in duodenal ulcer—I should not attempt to treat it with ascorbic acid.

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Groningen, Holland.

STREPTOCOCCAL INFECTION IN CHILDBIRTH AND SEPTIC ABORTION

SOURCE OF INFECTION AND GROUPING OF HÆMOLYTIC STRAINS

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THIS study is based upon 204 cases of puerperal fever and 101 cases of septic abortion. These were bacteriologically examined by taking swabs from the cervix (occasionally from the vagina) whenever possible before any antiseptic treatment had been given. The swabs were cultivated aerobically on blood agar from which strains of hæmolytic streptococci were isolated and shown to produce hæmolysin in Hartley broth cultures. Such strains were obtained from 62 cases of puerperal fever (30 per cent.) and 15 cases of septic abortion (15 per cent.). Of these 77 cases, 33 (43 per cent.) were very severe, endangering life, and 11 were fatal. Only one other death, from puerperal insanity, occurred so that with this exception all the deaths resulted from streptococcal infection.

SOURCE OF INFECTION IN PUERPERAL FEVER

Following the work of Smith (1931) the view became prominent that the source of the majority of puerperal infections due to hæmolytic streptococci is the nose and throat of attendants. It appears however that quite frequently the patient's own nose or throat may furnish a strain identical with that found in the uterus. Hare and Colebrook (1934) noted that about 30–40 per cent. of women who have acute puerperal infection harbour a potentially pathogenic type of streptococcus in the nasopharynx and that often the uterine and nasopharyngeal strains from one patient are serologically identical.

An attempt was made to determine the source of infection in cases that had hæmolytic streptococci in the uterus, excluding septic abortion. Swabs from the patient's throat and nose were cultivated as described above. In respect of 46 cases it was possible to obtain swabs from the throat and nose of attendants and others who had been in contact with the patient. When hæmolytic streptococci were isolated from the nose or throat of the patient, or any of the contacts, the strains were compared with the uterine strain of that patient, to determine whether or not they were identical. If the fermentation tests agreed, sera were prepared and cross-agglutination performed. Agglutinin absorption was used as the final criterion of identity.

In 10 cases hæmolytic streptococci were obtained from one or more contacts, and in 2 of these from the patient's nose or throat as well. In 8 other cases strains from the patient's nose or throat were compared with the uterine strain, contacts not being examined. The results are summarised briefly.

CASE 1.—One strain from the throat of a contact was not identical with the uterine strains.

CASE 2.—Three strains from the throat of three contacts were not identical with the uterine strain, but cultures from the nose and the throat of the patient corresponded with the infecting strain. This patient had laryngitis for a fortnight before confinement.

CASE 3.—A strain corresponding to the infecting strain was obtained from the throat of a contact, but a strain from the patient's throat was different.

CASE 4.—Two strains from the throat of two contacts were not identical with the infecting strain.

CASE 5.—Two strains were obtained from the throat of a contact. One of these and also cultures from the throat and nose of the patient corresponded with the uterine strain.

CASE 6.—Four contacts each yielded hæmolytic streptococci from the throat. One culture was identical with the infecting strain but this came from a nurse who was not attending the patient although employed in the same ward.

CASE 7.—Strains identical with the uterine strain were obtained from the throat and nose of a contact and from the throat and nose of the patient.

CASE 8.—A strain identical with the uterine strain was isolated from the throat of a contact, a handywoman suffering from tonsillitis.

CASE 9.—Two contacts yielded strains from the throat and nose but they were not identical with the infecting strain.

CASE 10.—Occurred in the same ward as Case 9 and had the same contacts. The strains from the throat and nose of one of the contacts were identical with the uterine strain of this case.

OTHER CASES.—In 8 other cases strains from the patient's nose or throat were compared with the uterine strain. In 5 they were identical; in 3 they were different.

Thus for 12 of 18 cases strains identical with the uterine strain were isolated from the throat or nose of the patient herself or of contacts; six times from the patient only, four times from a contact only, and twice from both patient and contact. There is no absolute proof that these were the sources of infection, but it is highly probable. When both patient and contact harbour the infecting strain in the nasopharynx the actual source becomes problematical. In 2 instances pharyngitis or tonsillitis was in evidence.

These results lend support to the view that the source of uterine infection is often the patient's own nasopharynx. And this is further suggested by comparing the incidence of hæmolytic streptococci in the throat and the nose of those who have a streptococcal uterine infection with the incidence among contacts or patients not so infected, as indicated below.

Swabs from the throat and nose were taken from 60 cases of puerperal fever or septic abortion in which hæmolytic streptococci were isolated from the uterus. This organism was obtained from the throat of 12 (20 per cent.) and in the nose of 9 (15 per cent.). These figures contrast with the findings in a group of apparently healthy contacts and patients from whom streptococci were not isolated from the uterus; 341 throat swabs were examined, 38 (11 per cent.) being positive, and of 329 nose swabs only 4 (1·2 per cent.) were positive. The difference is particularly great with regard to the incidence of positive nose swabs.

Of the 60 cases, 16 (27 per cent.) harboured hæmolytic streptococci in the throat, the nose, or in both. As indicated later, cultures from 12 of these cases were shown to belong to the group A of Lancefield (1933), the group that is potentially pathogenic for man and the cause of practically all severe cases of uterine infection in the puerperium.

GROUPING OF STRAINS BY THE PRECIPITIN TEST

Following the technique of Lancefield (1933) and Lancefield and Hare (1935) extracts were made from cultures and sera prepared in rabbits. Four sera containing group precipitin for group A strains and one serum containing group precipitin for group B were used. Some of these sera were tested and their properties confirmed by Dr. Ronald Hare, Queen Charlotte's Maternity Hospital, London, who also tested and assigned to their appropriate group the extracts of our strains that did not react with group A serum.

The importance of group A strains of hæmolytic streptococci in the ætiology of puerperal fever and their potential pathogenic properties for man in contrast to other groups has been stated by Lancefield (1933) and Lancefield and Hare (1935). Our results support this.

(*a*) *Strains isolated from the cervix or vagina in cases of puerperal fever.*—A total of 61 strains from 57 cases were tested: from the cervix only in 50 cases, from the vagina only in 3 cases, and one strain from each source in 4 cases. Of the 61 strains 60 belonged to group A. The remaining strain belonged to group B. It was isolated from the vagina of a patient who developed septicæmia and pneumonia and died. A culture from the blood was not available.

(*b*) *Strains isolated from the cervix in cases of septic abortion.*—One strain from each of 12 cases was tested: 8 were group A, 2 group B, 1 group C, and 1 group D. Two cases were fatal, each infected with a group A strain.

(*c*) *Strains isolated from the nose or throat of patients with puerperal fever or septic abortion.*—From 12 cases of puerperal fever 17 strains from the patient's nose or throat, in 5 cases from both situations, were tested. These were all group A. In 8 cases they were identical with the culture from the uterus as judged by agglutinin absorption. In 4 cases, although the uterine and nasopharyngeal strains were both group A, they were not identical, presumably belonging to different types of this group. From one fatal case of septic abortion a group A strain was found in the throat as well as in the uterus, but their identity was not tested by agglutination.

(*d*) *Strains from the nose or throat of contacts with cases of puerperal fever.*—The 17 strains from the throat or nose of 13 contacts were tested: 15 of these were group A, 1 was group B, and 1 belonged to group H.

COMMENTS AND SUMMARY

1. *Streptococcus hæmolyticus* was isolated from the uterus twice as frequently in puerperal fever as in septic abortion, 30 per cent. and 15 per cent. of cases respectively.

2. The importance of group A strains in the causation of uterine infection in the puerperium, as stated by Lancefield and Hare (1935), is again demonstrated. Of 61 strains from 57 cases 60 belonged to group A, and it is not certain that the exception (from the vagina of a fatal case) was actually the infecting strain. In septic abortion group A strains were recovered from the uterus in only 8 of 12 cases.

3. All the deaths, with the possible exception noted in paragraph 2, were caused by group A strains.

4. The statement of Hare and Colebrook (1934) that 30–40 per cent. of women harbour the human pathogenic type of streptococcus in the nasopharynx at the time of puerperal infection and that not infrequently the nasopharyngeal and uterine strains are serologically identical is supported by our results. Hæmolytic streptococci were found in the throat or nose of 16 of 60 cases of puerperal uterine infection (27 per cent.). Cultures from 12 cases only were tested by the precipitin reaction but all were found to belong to group A.

5. An effort was made to determine the source of puerperal uterine infection by looking for a strain of streptococcus identical with the uterine strain in the nasopharynx of the patient or attendants, the criterion of identity being based on agglutinin absorption. In 12 instances identical strains were found, six times in the patient's nose or throat, four times in the nose or throat of an attendant, and twice in both patient and attendant. There is therefore considerable support for the view that the patient's own nasopharynx may frequently be the source of the uterine infection.

This work was initiated by Dr. R. Veitch Clark, medical officer of health for Manchester, and was done on behalf of the maternity and child welfare committee of the public health department of Manchester, who have provided an annual grant for the purpose. The assistance of Dr. D. Sage Sutherland, superintendent of Monsall Fever Hospital, and members of his staff, is also gratefully acknowledged.

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EPIDURAL HÆMORRHAGE DUE TO HÆMOPHILIA

CAUSING COMPRESSION OF THE SPINAL CORD

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Neurological complications of hæmophilia, due to spontaneous hæmorrhage into part of the nervous system, are not common. Seddon[1] comments on the rarity of such lesions in reporting a case, probably of hæmatomyelia in the third and fourth lumbar segments causing paralysis of the quadriceps, pectineus and adductor magnus, with sensory loss corresponding to these segments. There were only two neurological complications in 29 cases of hæmophilia quoted by him and observed at St. Bartholomew's Hospital and the University Hospital, Michigan. Only 19 such cases are mentioned in Bulloch and Fildes's monograph on hæmophilia.[2] Tidy[3] states that "the most dangerous hæmorrhages are those into the brain and spinal cord," but no examples are given in this work. A case of hæmatomyelia occurring in the cervical enlargement of a hæmophiliac and causing respiratory paralysis is reported by Ordway and Gorham.[4] Gunther[5] states that bleeders may have meningeal hæmatomas leading to cerebral or spinal paralysis, but no certain case of the former has yet been known.

Two cases of paraplegia are quoted in Bulloch and Fildes's monograph; one, published by Ledoux in 1876, was that of a boy aged about six, a known hæmophiliac, who was suddenly seized with severe girdle pains, and extensive paraplegia set in involving the lower limbs, trunk, and partly the arms. The boy survived this and the case was regarded at the time as one of hæmorrhage into the spinal cord. In the other, published by Van der Scheer in 1850, a man aged 30 was seized with severe pain in the back and paralysis of the legs after his first attempt at coitus; he died comatose and paraplegic the next day.

The clinical features of the case now to be described appear to have been due to a spontaneous epidural hæmorrhage in the upper part of the spinal canal causing compression of the cervical cord. I have found no reported case of this kind, either cranial or spinal, due to hæmophilia. P. E. Weil[6] records a case of paraplegia caused, he believed, by lumbar puncture carried out four years earlier on a patient who was a hæmophiliac. He describes meningeal hæmorrhage as being "altogether exceptional," and stated that this was the only case of the kind that he had seen.

CASE REPORT

A cardboard-box maker, aged 27, was admitted to the Archway Hospital, Highgate, on Jan. 10th, 1934, with a 24 hours' history of acute pain in the neck, legs, and back of sudden onset. When it began, he said, he was unable to bend his back or even to "move at all." He also complained of painful swellings in the left wrist-joint and on the right shin just above the ankle. There was no history of trauma. The previous history was: 1909–10, "rickets and anæmia," for which he was treated for some years; 1925, "swelling" over right tibia, and albuminuria; 1926, severe prolonged hæmorrhage following extraction of teeth (transfusion necessary); 1930, hæmatoma of right thigh, which recurred five months later, and hæmorrhage into left knee and right rectus abdominis muscle. Since 1930 there had been repeated hæmorrhages into the thigh, calf muscles, knee-joint, and left elbow.

No family history of hæmophilia could be obtained even after searching inquiry from the available relatives. That it was absent could not, however, be regarded as established, since the patient's mother was one of a family of fifteen children, and she had lost touch with most of these siblings. The patient had twelve brothers, five of whom died in infancy but there was nothing to suggest hæmophilia as a cause of death. In passing it is worth noting that this case exemplifies the fecundity which has been noted in hæmophiliac families.

Examination.—The patient was a frail sallow man of rather poor intelligence. He was fully conscious and showed much anxiety. The temperature, pulse, and respiration-rates were normal. Blood pressure 128/68. No abnormality was found in the heart or lungs; the spleen was not palpable. There was a swelling over the left wrist-joint, with painful limitation of movement, and a tender firm swelling over the crest of the right tibia just above the ankle, about 1½ in. broad and 3 in. long; the overlying skin showed bruising and discoloration. The left foot was almost fixed in plantar flexion with fibrous shortening of the calf muscles which appeared to be adherent to the skin and were presumably the site of an old hæmatoma. Although there were no external signs of bruising anywhere along the vertebral column, there was great pain on flexion and extension of the spine, particularly in the cervical and lumbar regions; but not specially on *rotation* of the neck. The cervical and upper thoracic spinous processes were very tender. There were no signs of meningeal irritation, such as head retraction or Kernig's sign, and rigidity seemed to be due to voluntary fixation. The patient did not complain of headache but vomited twice soon after admission.

All the tendon-jerks were brisk with the exception of the right ankle-jerk which could not be obtained. The knee-jerks were much increased and there was a poorly sustained left ankle-clonus. Plantar responses were extensor, more markedly on the left. The abdominal reflexes were equal on the two sides. There was no loss of motor power in the legs but the patient was extremely reluctant to move them. There were no sensory changes other than the pain and hyperalgesia already described, and no abnormality in the cranial nerves or fundi. Sphincter control was normal. The urine was loaded with albumin but contained no blood.

On lumbar puncture the *cerebro-spinal fluid* dripped slowly out and was clear but deep yellow. A report stated that it formed a coagulum overnight, that the total protein was 1·2 per cent., and that there were 4 cells and 9 red cells c.mm. A blood *examination* showed:—

Red cells	6,512,000	Polymorphs	75%
White cells	7,600	Lymphocytes	18%
Hæmoglobin	105%	Large mononuclears	7%
Colour-index	0·8		
Platelets	232,000		

The bleeding-time was 1 min. 50 secs., the clotting-time 17 mins., and the capillary resistance normal. The Wassermann reaction was negative.

Course of Illness.—During the week after his admission the patient's general condition improved; no further hæmorrhages were detected, and the pain, controlled by moderate doses of morphia, gradually subsided. It persisted, however, in the lower lumbar region and over the sacrum where it was brought on particularly by flexing the thighs, as in sitting up. A small deep hæmatoma had appeared at the site of the lumbar puncture. Pain in the neck was absent after the first week, but the other physical signs remained unaltered. A mild attack of acute tonsillitis intervened on the sixth day but subsided in four days.

A fortnight after admission there was profuse hæmaturia, with bright red blood in the stools and epistaxis. The patient then complained of much tenderness in the left loin and an examination of the urine revealed the presence of a few hyaline and granular casts, pus cells, and numerous streptococci. There was no increase in pain over the spine, and although the tendon reflexes remained abnormally brisk, extensor responses could no longer be elicited. Radiography of the spine revealed no abnormality.

A further blood count at this stage gave :—

Red cells ..	5,016,000	Polymorphs	85%
White cells ..	26,000	Lymphocytes	12%
Hb.	82%		

Ten days later hæmaturia was still present though it was less severe, and there was still pain in the sacro-iliac region with tenderness in the loin. The patient's general condition was good, and he had no severe degree of anæmia, so that blood transfusion was not considered necessary at this time; the temperature remained normal. A fortnight later the urine contained a trace of albumin and a few red cells. A hæmatoma developed in the left buttock but disappeared in a few days. All pain had gone.

A further blood count gave :—

Red cells ..	5,130,000	Polymorphs	69%
White cells ..	7,200	Lymphocytes	30%
Hb.	90%		

On March 5th, nine weeks after admission, the patient was allowed to get up for the first time, but after three weeks there was a rise of temperature and a large hæmorrhage into the left elbow-joint occurred. (Aspiration with a wide-bored needle withdrew blood clot.) This resolved in ten days. On April 5th the only abnormal sign present on examination of the nervous system was exaggeration of the knee-jerks and left ankle-jerk. Lumbar puncture was repeated and the fluid was quite normal: cells, 5 per c.mm.; total protein, 0·04 per cent.

A further blood count gave :—

Red cells ..	4,960,000	Polymorphs	71%
White cells ..	20,400	Lymphocytes	29%
Hb.	90%		
Platelets ..	659,000		

The bleeding-time was 1½ mins., and the clotting time 30 mins.

The high white count at this stage was presumably due to the process of absorption of blood clot in the elbow-joint.

Early in May the patient was looking and feeling fit and well. He was up and about and free from pain or any other symptoms or signs. The urine contained a trace of albumin and a few red cells but no casts. He was discharged on May 7th and enjoyed good health until December, 1934, when he was readmitted for further hæmorrhages into the elbow and calf muscles. There were no abnormal signs on examination of the nervous system on this occasion. The bleeding-time was 1½ mins. and the clotting time 45 mins. The urine constantly contained a fair trace of albumin, some red blood-cells, and a few hyaline casts. He was discharged fit after a few weeks. The tests for renal function on his first admission to hospital were normal.

DISCUSSION

The case here described is one of acute spinal compression, slight in degree, associated with hæmophilia. There can be no doubt as to the nature of the hæmorrhagic tendency, in spite of the absence of family history and the relatively late onset at 19 years. His history of repeated hæmorrhages into joints and elsewhere since that age, the blood picture, and the clinical manifestations of hæmorrhage were all characteristic.

Although in the illness here described the patient was bleeding from the nose, bowel, kidneys, beneath the periosteum of the tibia, into the left elbow-joint, and, it is assumed, outside the spinal theca—i.e., from no fewer than six situations—he never appeared to be desperately ill. His general condition remained good and gave rise to no great anxiety after the first few days, when the neurological signs began to recede. There was never any severe anæmia, the lowest blood count showing 82 per cent. of hæmoglobin. The advisability of transfusion with a view to increasing the coagulability of the blood was considered during the phase of hæmaturia, but this had almost ceased within a fortnight of its onset, and no transfusion was carried out.

It was noticeable, however, that albuminuria continued, and this had been noted on admission and on two previous occasions, two and nine years previously. There was never any œdema or other signs of impaired renal function, and the blood-urea and urea concentration were normal. Nephritis, a well-known feature in purpura, appears to be a rare complication of hæmophilia, though Barney,[7] quoting another authority, states that the changes of chronic nephritis are found post mortem in the kidneys of those hæmophiliacs who have suffered from repeated hæmaturia. In addition to the red cells some hyaline and granular casts were present in the urine in this case. The patient apparently had also a mild acute pyelitis, perhaps secondary to the tonsillitis which preceded it, but unequivocal evidence of true glomerulo-nephritis was lacking. I have found no references in the literature to physiological albuminuria associated with hæmophilia except a general statement by Wright and Ross [8] that it occurs in some conditions, including hæmophilia, where there is diminished coagulability of the blood. It must be remembered that albuminuria had been observed in this patient nine years previously, and although it persisted, there was no evidence of a progressive renal lesion. The exact nature of the renal condition must remain uncertain unless further progress can be observed. It was thought that there might be some relation between persistent albuminuria suggesting undue capillary permeability, and the high protein content of the cerebro-spinal fluid. But in hæmophilia the capillary permeability is unchanged, and the Froin syndrome is more easily explained as purely the result of a spinal subarachnoid block.

When the patient was first seen the association of hæmophilia and severe pain in the back of the neck suggested the possibility of a spontaneous subarachnoid hæmorrhage, but there were no other clinical signs to confirm this and evidence of pressure on the cord was present. Greenfield and Carmichael [9] state that xanthochromic fluids due to subarachnoid hæmorrhage rarely contain more than 0·100 mg. of protein in 100 c.cm. of cerebro-spinal fluid, even in the most highly coloured fluids. Large amounts of protein, more than 1 per cent., are most commonly associated with cases of spinal tumour, where a well-defined paraplegia usually develops. The signs of cord compression in this patient were slight and transient, but blockage of the spinal subarachnoid space may be complete without severe pressure on the cord itself, and it is assumed in this case that such a block, due to extradural hæmophiliac hæmorrhage at the site of pain in the lower cervical region, had occurred. The relatively large amount of protein in the cerebro-spinal fluid suggested that severe obstruction had been present for at least a week or more. The patient, however, declared that the onset of pain dated only from the day before admission to hospital, and it is possible that continual oozing had been going on for some days with extension of the resulting hæmatoma down the cord, where eventually it caused irritation of the lumbar roots. Such a hæmatoma may be expected to extend more easily in a longitudinal direction and signs of direct pressure on the cord may, therefore, be delayed till some time after the onset of hæmorrhage.

That this subarachnoid block was only temporary was shown by the normal pressure and composition of the cerebro-spinal fluid two months later.

My thanks are due to Dr. C. D. S. Agassiz, medical superintendent of Archway Hospital, for permission to publish this case; to Dr. B. Kessel and members of the

staffs of other hospitals in which the patient had been treated, for reports on the previous history; to the staff of the Archway Group Laboratory for the pathological investigations; and to Dr. E. A. Blake Pritchard, consulting neurologist to the L.C.C., for valuable advice in the preparation of this report.

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Clinical and Laboratory Notes

PAROXYSMAL TACHYCARDIA TREATED WITH ACETYLCHOLINE

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ALTHOUGH Stepp and Schliephake [1] in 1925 reported full and almost instantaneous control of recurring tachycardia by intramuscular injections of a 20 per cent. choline derivative solution, and Starr [2] in 1933 described the immediate termination of 24 attacks of paroxysmal tachycardia in seven patients by the subcutaneous injection of acetylcholine, there are few, if any, accounts of this drug being used for the purpose in this country. The following case suggests that it might be more widely employed.

Acetylcholine is the parasympathetic hormone and is presumed to act on the heart by stimulating the vagal nerve-endings; it has the further action of peripheral vasodilatation, and should therefore be injected only with the patient lying *prone*, to counteract the accompanying hypotensive effect.

A boy, aged 14, was admitted to the Radcliffe Infirmary on August 13th, 1935. He has two siblings, alive and well; the mother died of "heart trouble." He has always been healthy, except for occasional "bilious attacks." His tonsils were removed 10 years ago and he has worn glasses for 11 years for refraction error. The present illness started on August 8th, five days before admission, with vomiting, and the patient was thought to be having another "bilious attack." He was sent to bed and was seen on August 12th (the day before admission) by his doctor, who noticed that his pulse-rate was unusually rapid. As it did not slow on the following day, and as he was still vomiting, he was sent into hospital.

On admission he was found to be an undersized boy, much cyanosed, and smelling strongly of acetone. He had a dry, thickly furred tongue; the heart, which was not enlarged clinically, was beating, with an apparently normal rhythm, at 200–240 per minute, with occasional slowing for a few beats. The temperature was 95·8° F. There was no enlargement or tenderness of the liver, no œdema of the legs or other abnormal physical sign, apart from a few septic teeth. The systolic blood pressure was 80 mm. Hg; the diastolic was not obtainable.

The case was diagnosed as one of paroxysmal tachycardia, and various attempts to control the attack—including pressure on the carotids, an ice-bag to the præcordium, and an intravenous injection of strophanthin gr. 1/500—were made without effect. Quinidine, grs. 2½ was given by mouth four-hourly, but next day, August 14th, the tachycardia was still continuing though after the patient had been put to bed the rate had decreased to, and remained at, 160 per minute. This slight slowing of the heart-rate suggested that the condition might be one of auricular flutter, but an electrocardiogram (Fig. 1) confirmed the original diagnosis of paroxysmal tachycardia, so it was decided to try a subcutaneous injection of acetylcholine (B.D.H.) 25 mg. This was given, with the patient lying prone, but without any obvious result.

On the following day, August 15th, the heart-rate was still 160 per minute, but the heart was enlarging, the apex-beat being just outside the nipple line. The dosage of quinidine was increased to grs. 4 four-hourly, and a further subcutaneous injection of acetylcholine—this time 50 mg.—was given. Two minutes later a few dropped beats were noticed.

On August 16th the apex-beat was in the anterior axillary line, the boy's general condition was good (he stopped vomiting after admission and took fluids well), and the heart-rate was still steady at 160. Another injection of acetylcholine, 75 mg., was given, and two minutes later the heart stopped abruptly for one second, afterwards resuming a normal pace for fifteen seconds; it then alternated a few fast and a few slow beats for one minute and became fast for two minutes. This last sequence was repeated three times in ten minutes. Four hours later there were alternating periods of slow and rapid beating, but the periods of slow rhythm were gradually lengthening. Five hours after the injection the pulse-rate was 72, with an occasional extrasystole, and the volume was good. The apex-beat had returned to within the nipple line.

On August 19th the boy was well. No extrasystoles; pulse slow and steady; blood pressure 85/35; temperature normal; apex-beat in fourth left intercostal space, 3 in. from the midline; no cardiac murmurs audible. Progress was thereafter uneventful until August 22nd, when the apex-beat was again found to be "out"—viz., in the fourth space, 4½ in. from the midline. The heart-rate remained normal (about 60) but an electrocardiogram taken on August 23rd gave evidence of myocardial damage, evidenced chiefly by notching of the Q R S wave, and widening of the Q S interval (Fig. 2).

Convalescence was uneventful until Sept. 9th, when the boy had five attacks of tachycardia, each of which lasted about five minutes and stopped spontaneously. During the following fortnight he had a few further attacks. He was fully aware of the beginning, duration, and end of each attack, but was never distressed. He had no further trouble in October, and was discharged from hospital, with a good exercise tolerance, on Nov. 3rd. His heart remained enlarged, with slow, steady beat, and no murmurs; his blood pressure was 115/60.

This case presents several unusual features. First,

FIG. 1 FIG. 2

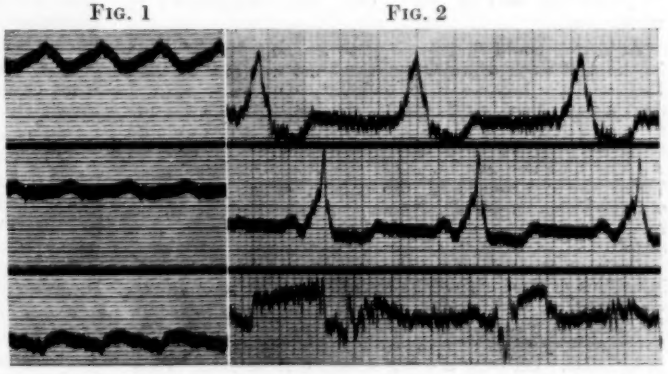

FIG. 1.—Electrocardiogram taken during attack of paroxysmal tachycardia. (The time-intervals are the same as in Fig. 2.)

FIG. 2.—Normal rhythm with notching of Q R S wave and widening of Q S interval.

the boy's age (14 years) which is young for the onset of paroxysmal tachycardia. Secondly, the large dose of acetylcholine required to control the tachycardia; Starr gives a dose of 30–50 mg. for adults. Thirdly, the absence of any unpleasant sequelæ to the injections, such as a sudden sensation of warmth in the face, hyperpnœa, sweating, salivation, and precordial pain, some or all of which are usually supposed to occur.

As to the cause of the tachycardia, the following are facts of note: (1) there was no previous history of rheumatism; (2) there was no evidence of a diphtheritic infection (throat-swab was negative to Klebs-Löffler bacillus); (3) while in the ward the patient developed a small carbuncle on his right forearm, and *Staphylococcus aureus* was recovered from his throat.

It is difficult to assess the value of any remedy in paroxysmal tachycardia, which is notoriously unresponsive to treatment and usually stops spontaneously; but it seems worth recording that in this case increasing doses of acetylcholine were followed by progressive slowing of the heart-rate. This supports the view that it is valuable in the treatment of paroxysmal tachycardia.

In conclusion, I wish to thank Dr. A. G. Gibson for permission to publish this case, and Dr. W. Stobie and Dr. A. M. Cooke for encouragement and advice in regard to the treatment.

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MYELOBLASTIC LEUKÆMIA PRESENTING SOME UNUSUAL FEATURES

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AND

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THE CLINICAL ASPECT. (J. H. W.)

Mrs. A., aged 70, had been a patient of mine for 12 years. Except for attacks of bronchitis during the winter she required little medical attention. Towards the end of May, 1935, she complained of weakness.

At first I could find nothing to account for this, but in the first week of June I noticed she was anæmic and this anæmia became more evident. On June 12th I sent a sample of her blood to Dr. Knyvett Gordon for examination and received a report giving a provisional diagnosis of myeloblastic leukæmia with a grave prognosis. At this time she had no other symptoms but weakness. There was no sepsis in the mouth or elsewhere—no enlarged glands, no enlargement of spleen or liver, no hæmorrhage. The urine was free from albumin and sugar.

She was treated with intravenous and intramuscular injections of liver extract daily, with ferri et ammon cit. grs. 30 t.d.s., acid. hydrochlor. dil. m 30 t.d.s., p.c., and injections of calcium gluconate. Clinical response was, however, very slight; her anæmia and weakness continued to increase. On July 3rd the spleen was palpable below the costal border, but the enlargement was temporary for later I could not feel it. She became unconscious on July 13th and died on the 20th.

I made a post-mortem examination on the same day and found a considerable amount of fat, although no food had been taken for a week before death. The spleen was enlarged to the size of a small coconut and was very friable. The liver was slightly enlarged and very soft. The other organs showed no obvious abnormality. The humerus and portions of the liver and spleen were removed for microscopical examination.

THE PATHOLOGICAL ASPECT. (A. K. G.)

During the illness 22 blood films were examined and five total counts were made on oxalated blood. Subsequently, the liver, spleen, and bone-marrow were scrutinised.

The first set of films, taken on June 12th, showed polynuclears 38 per cent., lymphocytes 10 per cent., hyalines 1 per cent., and eosinophils 1 per cent., with 20 per cent of myelocytes, 15 per cent. of myeloblasts, and 15 per cent. of myeloblastic plasma cells. The total counts were red cells 3,050,000, white cells 9200, hæmoglobin 51 per cent. A diagnosis of acute myeloblastic leukæmia was made and a fatal prognosis given. The 22 differential counts were then plotted on a graph, which showed a steady relative increase in the number of myeloblasts and corresponding decrease in the polynuclears and myelocytes, the figures for the last test, just before death, being myelocytes 10 per cent., myeloblasts 64 per cent., and plasma cells 3 per cent., with 10 per cent. of a primitive type of cell closely resembling, if not identical with, the lymphoidocyte. The lymphocytes remained steady throughout at about 10 per cent., mononuclears 3 per cent. An interesting feature was the occurrence of transient rises in the relative numbers of the polynuclears, corresponding to the injections of liver extract. The last total count, a week before death, showed red cells 1,475,000, white cells 17,100, and hæmoglobin less than 15 per cent.

Post mortem, the medullary cavity of the humerus was closely packed throughout the length of the bone with marrow of a pinkish-grey. In films and subsequent sections this was found to consist almost entirely of myeloblasts and a more primitive cell resembling the lymphoidocyte. Myelocytes were present, though their granules were scanty suggesting an intermediate form between the myelocyte and the myeloblast. Very few cells of the erythrocyte series were seen. An accurate differential count of the marrow films was scarcely possible on account of the number of dead cells which could not be identified.

The liver showed infiltration, both interlobular and intercellular, with myeloblasts; a moderate degree of fatty degeneration was evident and small scattered deposits of free iron were seen. In the spleen, the Malpighian bodies showed no histological abnormality, while the pulp was infiltrated throughout with myeloblasts. Free iron was not found.

The diagnosis of acute myeloblastic leukæmia was clear, the characteristic features in the blood being a steady transition from the granular polynuclear and myelocyte to the non-granular myeloblast and even back to a more primitive cell resembling the lymphoidocyte, together with an "aleukæmic" total count. As usual, the red cell factories became gradually exhausted, which was probably the immediate cause of death.

The last set of films were compared with some prepared from the blood of a lamprey, in which the leucocytes are practically all of the lymphoidocyte group, and the primitive cells of the patient corresponded very closely in type.

The case, presented some unusual features. Firstly, the age of the patient—the disease being uncommon after 25. Secondly, the absence of signs of sepsis in the mouth. This is very uncommon, as in the great majority of cases the illness begins with acute inflammation of the fauces and gums of the sloughing type and is, therefore, not infrequently diagnosed clinically as streptococcal infection, diphtheria, or Vincent's angina, and the condition of the

blood may escape investigation. I have, however, recorded a somewhat similar case [1] in which the age of the patient was 74 and there were no signs of sepsis. The patient died of a terminal pneumonia after a month's illness, with 92 per cent. of myeloblasts in the circulating blood. I have been unable to find any record of other cases occurring in old age.

As a rule, the patients die within a fortnight or so of toxæmia from the septic infection. This is not because sepsis is a cause of leukæmia—though sometimes it has been so described—but because myeloblasts and myelocytes have little or no antibacterial action, whether by phagocytosis or antibody formation. The evidence for this is twofold. If to a healthy subject an injection of sodium cinnamate or nucleinate is administered, the blood shows a marked polynuclear leucocytosis, but in myeloblastic and myeloid leukæmia no such effect is produced. Similarly, in health an injection of T.A.B. vaccine is followed by an increase in the titre of agglutinins to these organisms, whereas in leukæmia no response is evoked.

It is difficult to form any accurate conception of the general incidence of acute myeloblastic leukæmia, because it does not present itself clinically as a disease of the blood-forming organs, but rather as an acute infection. Even if the blood is examined, the absence of a leucocytosis may be misleading. Furthermore, if the slide is overstained or the reagents are not fresh, the nuclear characteristics of the myeloblast may not be evident and the cell is then mistaken for a lymphocyte. In 80 cases of myeloid leukæmia which have come under my personal observation, 6 were found to be of the acute myeloblastic type. The distinction is of clinical importance, because with care and treatment by X rays, *controlled by frequent examinations of the blood*, it is often possible to keep patients of the ordinary myeloid type alive and fairly active for a period of years. In the myeloblastic variety there is no alternative to a rapidly fatal course and treatment can be only symptomatic.

PRIMARY CARCINOMA OF THE LIVER

DESCRIPTION OF AN UNUSUAL CASE

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SINCE the time when Virchow pointed out the importance of searching carefully for a primary source at autopsy on cases of liver growths, the histology of carcinoma originating in the liver has been well defined, and it is now recognised to be a rare disease. This fact, in addition to the unusual pathology observed, prompts me to publish the following case.

DESCRIPTION OF THE CASE

The patient was a man of 56 who complained of mid-epigastric pain of five months' duration, not associated with food. He suffered also from precordial pain and dyspnœa on exertion. There was no indigestion or flatulence, and he had never been jaundiced. Four days before admission to hospital he had an attack of severe pain in the left loin, mental confusion, and headache, associated with diminution of urinary output and a furred tongue. He had worked in a sulphuric acid works for the previous 18 years, and many years before had been a heavy drinker, but until recently he had enjoyed good health.

Examination revealed some tenderness in the left loin. The right kidney was unduly palpable, but smooth and mobile and of normal size. No tumour could be felt above it. There was no clinical abnormality of the nervous system. The heart was not abnormal except for the occasional occurrence of multiple extrasystoles. The urea content of the blood was 47 mg. per 100 c.cm. The urine was sterile and acid. It contained 0·5 per cent.

FIG. 1.—The right kidney, whose pelvis is filled with opaque solution, is being displaced downwards by an oval calcified tumour springing from the right lobe of the liver.

of urea, and there were pus cells and granular casts in the deposit. The average daily output was 1650 c.cm.

By cystoscopy a normal bladder and ureteric orifices were seen. The right ureter was catheterised without difficulty and a pyelogram was taken immediately afterwards (Fig. 1). A large oval stippled shadow is seen in the region of the right lobe of the liver displacing the right kidney downwards. It was assumed to be produced by a calcified hydatid cyst of the liver.

Before further investigations could be carried out the patient died quite unexpectedly, seven days after admission to hospital. The mode of death was suggestive of acute cardiorenal failure. The temperature and pulse-rate had not varied from the normal during the period of observation.

Post-mortem examination.—The heart was slightly enlarged, with pale, lax, dilated musculature. There was no coronary or valvular disease, and the aorta was normal. Except for some old adhesions of the left pleura, the lungs were normal. There was no ascites, and no abnormality of the gastro-intestinal tract, spleen, or pancreas. The liver was adherent to the diaphragm. An ovoid smooth tumour, size 14 × 9 × 7 cm., sprang from the under surface of the right lobe, pushing the liver upwards, the kidney downwards, and the inferior vena cava to the left. It was adherent only to the liver and diaphragm, and was easily separable from the other adjacent viscera. It was completely enclosed in a thin, irregularly calcified shell. On section there was a central branching core of gelatinous fibrous tissue surrounded by a homogeneous, soft, friable, vascular substance, maroon in colour. At no point was continuity demonstrable between this tumour substance and the surrounding liver; it was everywhere separated from it by the capsule. The rest of the liver was quite normal, and did not show any of the macroscopic changes of cirrhosis or new growth. No other abnormality was found except for a few patches of cortical

[1] Med. Press and Circ., 1931, cxxxi., 207.

necrosis in the left kidney over which the surrounding capsule was adherent.

Microscopical sections stained with hæmatoxylin and eosin show the tumour to consist of a degenerated œdematous fibrous core and epithelial cells growing in strands and small masses. The cells are irregular in size and shape, but mainly polyhedral, and resemble the cells of the liver parenchyma. Most of them have a circular eccentric nucleus with a well-marked chromatin network and nucleolus. Some have two or more nuclei, and giant cells of four or five nuclei are common. The cytoplasm is pale, uniform, and basophil. Much extravasated blood

FIG. 2.—Section of the growth (× 300). Multi-nucleated giant-cells are seen, and much extravasated blood in the intervening spaces.

fills the spaces between the tumour cells (Fig. 2). Sections taken from various parts of the liver do not show any of the changes of cirrhosis.

DISCUSSION

Classification of primary carcinoma of the liver.—The following classification is suggested by Ewing:

(1) Hepatoma, arising from the cells of the liver parenchyma.

(2) Cholangiona, arising from the intrahepatic bile-ducts.

(3) Mixed type, containing elements of both.

Each of these types may occur as a solitary adenomatous or carcinomatous tumour, as a massive infiltrating growth, or as multiple nodules. Cirrhosis coexists in 85 per cent. of hepatomas and 50 per cent. of cholangiomas (Eggel). It is uncertain which of the two main types is commoner, but more cases of the hepatoma group have been reported.

Clinical features.—There is no characteristic clinical picture. Wasting, anæmia, and pain in the epigastrium or right hypochondrium with ascites may indicate the presence of a malignant tumour. Jaundice is present in 61 per cent. of cases, and is commoner in cholangiomas than in hepatomas. The spleen is enlarged in a third of the cases. Fever and leucocytosis are found in 14 per cent., and are associated with rapidly growing necrotic growths.

Four well-defined clinical types can be distinguished:

(1) No symptoms are referable to the growth, and the patient dies after a short illness, as in the case here described.

(2) Carcinoma of the liver is found at autopsy on patients dying from other conditions.

(3) A well-marked history of cirrhosis ends rapidly with hepatic tumour, wasting, jaundice, and ascites.

(4) An obviously malignant enlargement of the liver develops in a previously healthy patient. These are usually mistaken for the much commoner cases of extensive secondary deposits in the liver without an apparent primary growth.

Nature of primary liver growths.—The sequence of cirrhosis, regenerative nodular hyperplasia, multiple adenomata, and carcinoma is a well-recognised fact, and serves to explain the origin of those cases in which carcinoma is found in association with cirrhosis. In districts where parasitic diseases such as distomiasis and schistosomiasis are common causes of liver damage, primary carcinoma is relatively frequent. Thus L. W. Smith states that the ante-mortem diagnosis is readily made in the Philippine Islands, while Strong and Pitts point out that the disease is unusually prevalent amongst Chinese patients at the Vancouver General Hospital.

There occur cases, however, in which cirrhosis seems to be a secondary process resulting from the mechanical stimulus of the tumour itself, while it is absent in some 15 per cent. of liver-cell and 50 per cent. of bile-cell growths. For these a different mode of origin must exist. It is likely that many carcinomas not associated with cirrhosis result from the malignant transformation of a solitary adenoma, the process taking many years to evolve. Pepere goes so far as to state that all solitary adenomas of the liver are congenital, while congenital malignant adenomas have been recorded by Ribbert, Prescott, Karsner, Milne, and others. In the tumour here described, the presence of a complete calcified capsule is indicative of many years' duration, yet the microscopical appearance was one of active malignancy, and it is likely that the growth originated in a congenital adenoma which eventually underwent malignant transformation.

It is rare for primary liver carcinomas to metastasise, and extrahepatic metastases are found in only 20 per cent. of cases. The method of spread is by vascular embolism, the liver, lungs, and regional lymph glands being most commonly invaded. Distant metastases of hepatoma have the property of secreting bile and thus present an interesting analogy with metastases of thyroid carcinoma.

SUMMARY

A case is described of primary carcinoma of the liver presumably originating in a congenital adenoma. The clinical features and pathological nature of these rare growths are discussed.

I am indebted to Mr. Philip Hawe, of the David Lewis Northern Hospital, Liverpool, for permission to publish notes of this case.

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QUEEN MARY'S HOSPITAL FOR THE EAST END.—The Duchess of Marlborough presided at the festival dinner in aid of this hospital held at the Hotel Victoria on Nov. 25th. The institution serves a population of nearly 2,000,000 and requires an annual income of £50,000. A sum of £25,000 is required to clear off arrears and another £15,000 to build operating theatres, which are urgently needed. Subscriptions amounting to over £7000 were announced at the dinner.

MEDICAL SOCIETIES

TUBERCULOSIS ASSOCIATION

AT a meeting of this association held at Manson House on Nov. 22nd, papers were read by Dr. E. L. MIDDLETON (H.M. Medical Inspector of Factories) and Dr. P. HEFFERNAN on

Industrialism and Tuberculosis

Dr. Middleton said that, after spending nearly fifteen years in matters relating to industrial hygiene, he had been impressed by the importance of the effect of certain occupations on the health of those taking part in them, and he wished particularly to emphasise the necessity for medical men to have some knowledge of the occupations in which their patients had been engaged. The occupational history might be quite as important as any other part of the past history of the patient. In certain scheduled industries, selection of individuals was carried out by statutory medical examinations of persons within two months of their employment. In these industries, which included occupations in which the workers were exposed to silica and asbestos dusts, the law provided for periodical medical examinations, at which the worker would be suspended if he was found to be suffering from tuberculosis or from pure silicosis to such a degree as to make it dangerous for him to continue work in that industry. There was a definite relationship between the occupational risk and the health of the individual. The two important factors in the spread of disease were, the opportunities for infection and the susceptibility of the individual to infection. Occupation might have a bearing on each of these factors, both in a general and in a special sense: in a general sense through proximity, the presence of infected dust, or defective workroom conditions which lowered the vitality and diminished the resistance of the workers; and in a special sense, among those whose occupation rendered them more liable to suffer from tuberculosis, as, for example, in a metal-grinding factory in which grindstones were used. Here not only would the chances of infection be greater than among the general population, but also the workers had been rendered specially susceptible to tuberculosis because they had inhaled siliceous dust and were, in fact, subjects of silicosis, whether in a diagnosable stage or not.

The real hazard to which workers in the silica group of occupations were exposed was silicosis and, strictly speaking, not tuberculosis. The association of the two conditions had been held to be so close that tuberculosis was taken as an index of the incidence of silicosis in certain industries. There were, however, all shades of opinion on this relationship. In a recent article, E. L. Collis and G. Udny Yule (Jour. of Indust. Hyg., 1933, xv., 395) had presented the mortality experience of an occupational group exposed to silica dust, as compared with that of a group exposed to dust not containing silica, and with that of the standard population of England and Wales. This study threw into sharp contrast the unfavourable position of persons employed in six selected groups of occupations exposing them to silica dust compared with workers in five selected occupational groups who were exposed to non-siliceous dusts. The excess mortality in the former class, though not confined to diseases of the respiratory system, was particularly notable in the figures for respiratory tuberculosis.

Dr. Middleton then threw on the screen slides illustrating the various processes in certain industries. In the *pottery industry* the occurrence of silicosis was especially associated with two sub-groups: earthenware and china. The *sandstone industry*, which included the quarrying and dressing of sandstone, represented perhaps the most widespread of all the silicosis-producing industries. Dust was produced in all processes in which the stone was cut, and in some of these processes the concentration of the dust cloud reached high limits. In the *granite industry*, in which the processes corresponded with those in the sandstone industry, the incidence of silicosis was not so severe. In both these industries silicosis was most frequent among the masons. The reason for the less severe involvement of the lungs in granite workers as compared with sandstone workers might be related to the composition of the dust. In granite, the amount of free silica rarely exceeded one-third of its weight, the other constituents being silicates, in which silica was present in chemical combination. *Grinder's rot*, the name formerly given to silicosis occurring in metal-grinders on sandstone, was a type frequently associated with tuberculosis. Grindstones made of sandstone had, however, been largely replaced by grinding wheels of artificial abrasive, such as carborundum and alumina, which contained almost no silica. *Sand-blasting* was at present the most serious cause of silicosis. The occupation was confined to a comparatively small number of workers, but had a high rate of mortality, and the onset of the disease followed a shorter period of exposure than occurred in almost any other of the silicosis-producing industries. *Manufacture of scouring powders.* This was a small industry, and from the point of view of silicosis it was not now important owing to the measures which had been taken to control dust produced in the processes. *Coal-mining.* The occurrence of silicosis was now well recognised amongst coal-miners, especially in the South Wales coalfield and in Europe and America. In the 3½ years ended December, 1934, the Silicosis Medical Board issued 702 certificates on account of silicosis in coal-miners, and, of these, 602 were in the South Wales area.

SILICOSIS AND DUST RETENTION

Dr. HEFFERNAN said that the main problem in industrial tuberculosis was the silicosis problem. It appeared to him that most of the prevailing confusion, controversy, and difference of opinion regarding pneumoconiosis and its relation to tuberculosis could be traced to a confusion between two entirely different conditions—silicosis and dust retention. Silicosis was an active and dynamic process with a specific histopathology, produced by the inhalation of free silica, or possibly its chemical equivalent, in a very fine state of subdivision. It was usually said that the dust particles must be below 2 microns in diameter to affect healthy lungs; below that limit, the smaller the dust particles, down to submolecular dimensions, the more active and rapid the development of the condition. Dust retention, on the other hand, was a passive process occurring typically in diseased lungs. Healthy lungs were capable of dealing with all forms of dust except that of free silica, or possibly certain combinations of silica-like asbestos, which when powdered might be capable of acting chemically as free silica did. The fibrosis produced by silica dust was characteristically nodular, was situated mainly subpleurally in the little collars of lymphoid tissue surrounding the necks of the infundibuli, gross obstruction of the root lymphatics and hilum glands being slight or absent. The fibrosis associated with dust retention was not nodular, was situated mainly at the roots of the lungs, and tended to spread outwards. The hilum lymphatic glands were affected and were greatly enlarged and packed with dust, general

thickening of the mediastinal mass following. In typical simple silicosis there were few pulmonary symptoms, apart from advancing dyspnœa and some cyanosis. In dust retention, in addition to the symptoms of pulmonary fibrosis, there was the presence of symptoms of the antecedent pulmonary disease—emphysema, chronic bronchitis, bronchiectasis, pulmonary tuberculosis. Finally, silicosis definitely predisposed to the development of pulmonary tuberculosis late in life, which dust retention per se did not do.

Although, however, these two conditions were entirely different, yet the problem was complicated by the fact that all lungs subject to silica dust were not healthy, and the reaction to silica of an unhealthy lung could be very different from that of a healthy lung. The specific fibrosis now tended to be massive in the diseased areas while still remaining discrete and nodular in the healthy areas, and the phenomena of dust retention were added to those of silicosis. They had therefore at one end of the scale, simple silicosis, with its liability to tuberculosis; at the other end simple dust retention with no such liability; and in between, various intermediate conditions, determined mainly by the two variables—the condition of the lung previous to and during exposure, and the proportion of free silica in the dust, with the size of its particles and possibly its freshness. The prevention of simple silicosis in healthy workmen obviously lay in the elimination of the dust of free silica in the atmosphere in which they worked, and in this direction great progress had been made; while to prevent the employment in dusty industries, such as coal-mines, of men with lungs already diseased, a careful "hand-picking" of the men at entry would be necessary, with periodic medical re-examination and elimination of all persons suffering from any form of pulmonary affection.

These conclusions, said Dr. Heffernan, were based upon 17 years' service as tuberculosis officer in Derbyshire, with a fairly extensive study of the literature. There were over 40,000 coal-miners in Derbyshire, and over 2000 limestone workers. They had never had a single case of silicosis reported in a coal-miner or a limestone worker, and their tuberculosis death-rate was normal or below normal. On the other hand, they had a few hundred gritstone masons and stone-cutters. Twenty-five years ago the death-rate from pulmonary tuberculosis among these men was more than ten times that amongst the adult general population of Derbyshire; and for the decade ending 1921 it was still five times the adult pulmonary tuberculosis death-rate. He was convinced that the freedom of coal-miners from terminal pulmonary tuberculosis was not, as had been suggested, because coal dust neutralised or minimised the toxins of the tubercle bacillus. The real reason was that, save in the mines where the men had to drill seams of quartzose rock, they did not suffer from true silicosis at all.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

THE November meeting of this society was held at Sheffield.

Unilateral Menstrual Pain

Prof. MILES PHILLIPS said that this term, although somewhat clumsy, was the best he could devise for a certain clinical group of cases in which severe pelvi-abdominal pain occurred solely in association with the menstrual periods, only and always on one and the same side. Two principal conditions were liable to cause such pain—namely, localised cornual adenomyoma, and hæmatometra in the rudimentary horn of a double uterus. Careful and understanding analysis of the patient's symptoms lead one to make a provisional diagnosis sufficiently correct to justify an exploratory operation. Prof. Phillips described in detail a number of cases in which the main symptom was fairly severe pain just at the onset of menstruation, in which, at laparotomy, typical adenomyomata were found in the uterus and excised with complete relief of the symptoms. Hæmatometra in the atretic horn of a double uterus was, he said, commonest on the right side, leading to a confusion with appendicitis and removal of this organ, with subsequent persistence of the symptoms which were alleviated only by removal of the rudimentary horn later.

Dr. J. W. BRIDE (Manchester) referred to a case of a calcified fœtus with a rudimentary horn, in which the patient's main symptom was dysmenorrhœa.—Dr. K. V. BAILEY (Manchester) asked whether endometrioma of one ovary could possibly cause unilateral dysmenorrhœa.—Prof. LEYLAND ROBINSON (Liverpool) said he thought the characteristic thing about these cases was that there was no variation in the menstrual pain, except perhaps that it got progressively worse.—Prof. DOUGAL, Mr. STACEY, and Mr. GLYN DAVIES mentioned that they had also come across cases of dysmenorrhœa with causes similar to those Prof. Phillips had described.

Chorio-Angio-Fibroma

Dr. C. H. WALSH (Liverpool) described a case of chorio-angio-fibroma, and said that the solid tumours of the placenta were extremely rare. They were of interest pathologically, and clinically they might be associated with abnormal states of the pregnancy and difficulties in the labour.

The specimen was obtained from a patient after delivery of her second child. The tumour of the placenta could be felt in the early stages of the labour through the external os. The labour was normal and the puerperium uneventful. The placenta with its two tumours weighed 2¼ lb. One tumour was the size of a grape-fruit and the other the size and shape of a cricket ball. They were embedded in placental tissue and there was a definite pseudo-capsule. The placental tissue was not infiltrating the tumours which could be shelled out easily. The cut surface was solid and looked like a soft fibroid. Microscopically they were found to consist of fibrous tissue with oval cells. In parts there were numerous blood-filled capillaries. The tumours appeared to be angio-fibromyomatous.

Advanced Ectopic Pregnancy

Three cases of advanced ectopic pregnancy were described.

(1) Mr. N. L. EDWARDS (Derby) described a case of a 5-para, aged 42, who passed per rectum portions of the fœtus, which was subsequently found to be lying in an extra-uterine sac.

(2) Mr. GLYN DAVIES stated that his patient, who was 26, was a 2-gravida. Her last menstrual period had occurred 23 weeks before, and she had had several shows. Radiography suggested death of the fœtus which was presenting by the breech. As the pregnancy was thought to be intra-uterine, an attempt was made to induce the patient but failed. Subsequent examination under anæsthesia led to the diagnosis of ectopic gestation. At operation it was found to be a right-sided ovarian pregnancy, advanced to about the thirtieth week.

(3) Prof. A. M. CLAYE (Leeds) said that his patient was a primigravida, aged 25, who was complaining of abdominal pain for the last three months. There had been some hæmorrhage on several occasions preceded by six months' amenorrhœa. The patient could feel fœtal movements.

When seen in September, 1934, the case was diagnosed as one of missed abortion. Attempts were made to induce labour. Subsequent examination under anæsthesia, and radiograms, led to a diagnosis of ectopic gestation. At operation the amniotic sac was found amongst the intestines from which the macerated fœtus was removed. The placental site was in the neighbourhood of the left Fallopian tube and the placenta and most of the sac were removed. Hæmorrhage was not excessive. Convalescence was uninterrupted. The points of interest in this case were: (1) the diagnosis (which was not reached for a very long time), and (2) the treatment at operation.

The PRESIDENT said that in cases where the condition was not diagnosed until some time after viability he wondered whether the operation could be delayed in order to obtain a live child.—Dr. BRIDE said that in his experience the condition was difficult to diagnose. He thought it safer to leave the placenta in situ when operating on these cases.—Prof. PHILLIPS said that he had seen six cases of advanced ectopic pregnancy. On three occasions he had left the placenta behind and had no trouble subsequently.—Mr. J. ST. GEORGE WILSON (Liverpool) mentioned a case which he first saw half-way through the pregnancy. He opened the abdomen at term and found the fœtus in the broad ligament. He was able to deliver the baby alive and left the placenta in the abdomen. Later he had occasion to reopen the abdomen and found no sign of the placenta.—Prof. D. DOUGAL (Manchester) referred to a case in which bougies were introduced and passed through the fundus of the uterus. An abdominal operation had to be performed and the sac containing the placenta, together with the uterus, was removed.

Dr. BRIDE showed a stone, weighing 4 oz., removed from the bladder by suprapubic cystotomy. Its presence was first noticed when a radiogram was taken during the last weeks of pregnancy. Cæsarean section was carried out.

LIVERPOOL MEDICAL INSTITUTION

AT a meeting of this institution on Nov. 14th, with Dr. C. O. STALLYBRASS, the president, in the chair, a lecture-demonstration on

Cineradiography

was given by Dr. RUSSELL REYNOLDS (London), who described his method of obtaining cinematographic records of X ray pictures by photographing the screen image. A 16 mm. cinematograph camera is used, and it is only necessary to take a short length of film of any one subject. The short film can then be formed into a band and run through the projector continuously so that the cases may be studied at leisure. Thus the expense of operating the apparatus is reduced to a minimum. Exposures of various parts of the human body have been made; and Dr. Reynolds stated that the joints, movements of the heart and thorax, the act of swallowing, and the passage of an opaque meal through the œsophagus, stomach, and duodenum had all been demonstrated satisfactorily. He thought that the method had many possibilities in diagnosis and for the study of physiological problems.

In the discussion which followed, Dr. R. E. ROBERTS spoke of the high quality of the radiograms obtained. Far from there being any graining or blurring, such as one would expect from photography of a screen image, many of the pictures were as clear as if they had been made under the most favourable conditions of direct radiography. In Dr. Roberts's opinion, the method would find its greatest usefulness in examination of the thoracic contents. Much new information should be obtainable, for example, about the movements of the heart.

Malignant Effusions

At a pathological meeting on Nov. 21st, with the president in the chair, Dr. R. Y. DAWBARN read a paper entitled Some Observations on Malignant Effusions. The examination of peritoneal fluid or pleural fluid for cancer cells need not be abandoned, he said, as a hopeless task. It was certainly almost impossible to recognise these cells in stained dry films, because the endothelial cells were too confusing; but many good results might be obtained by the comparatively old method of cutting paraffin sections of the centrifuged deposit.

After centrifuging the fluid in a large tube (about 1 in. in diameter with a round bottom) the supernatant fluid is poured off and the deposit washed in saline. The centrifuging is repeated if necessary. The saline is then replaced by Zenker's fluid and the deposit carefully separated from the bottom of the tube, without breaking, by means of a platinum wire. The deposit is left in the fixative over-night, after which it is treated with iodine in 50 per cent. alcohol, dehydrated, and embedded in paraffin. Sections are cut and may be stained with Weigert's iron hæmatoxylin.

Tumour cells might be recognised by various criteria: (1) they might be found in clumps, reproducing gland acini or the solid alveoli of carcinoma; (2) mitotic figures were an important, though not infallible, sign of tumour cells; (3) they often had hyperchromatic nuclei and might be far larger than any endothelial cells; (4) karyorrhexis was common in tumour cells, but rare in endothelial cells; (5) vacuoles occurred both in endothelial cells and tumour cells, but in the latter they might be very large and irregular in shape. Dr. Dawbarn showed sections illustrating the above points, including one made from the ascitic fluid of a case of Hodgkin's disease, in which a mitotic figure could be seen, apparently in an endothelial cell—a finding which must, he said, be very unusual.

WOLVERHAMPTON AND DISTRICT CLINICAL CLUB

AT the first meeting of the winter session, with Dr. S. C. DYKE in the chair, a discussion on Diseases of the Thyroid Gland was opened by Dr. J. H. SHELDON. The commonest exciting cause of exophthalmic goitre was, he thought, mental shock, the next in order being chronic septic infection—e.g., from the tonsils. The correct treatment of the disease was at present surgical, but there was some indication that pituitary disorder was at the back of exophthalmic goitre, and that ultimately the treatment might be medical by means of an antihormone. Ergotamine tartrate was of use in intractable cases.—Mr. R. MILNES WALKER believed that septic foci should be eradicated before operation, except in very acute cases. The chief indication for early surgical interference was rapid loss of weight. Preoperative treatment with iodine was essential, and Avertin was of great service in anæsthesia.—Dr. C. M. RIGBY, speaking of X ray treatment, said that the early cases were the most successful. Preliminary iodine medication, discontinued during treatment, was as essential as before operation.—Dr. W. R. SOMERSET mentioned cases which had improved after tonsillectomy.

REVIEWS AND NOTICES OF BOOKS

Hæmochromatosis

By J. H. SHELDON, M.D. Lond., F.R.C.P. Lond., Hon. Physician to the Royal Hospital, Wolverhampton, and the Guest Hospital, Dudley; late Hunterian Professor, Royal College of Surgeons of England. London: Humphrey Milford, Oxford University Press. 1935. Pp. 382. 25*s*.

THE monograph on hæmochromatosis by J. H. Sheldon will surely become recognised as the classical account of this mysterious disease. Dr. Sheldon says in his preface, and none will disagree, that without adequate case records it is impossible to construct a faithful description of any diseased state. He has collected 311 such records, which he accepts as genuine, from the literature, and has analysed them in order to present as complete a picture as possible of the clinical features and pathological appearances characteristic of hæmochromatosis. He discusses also the knowledge available concerning the metabolism and chemical findings, and the experimental work that has been done in an attempt to produce a similar picture in animals. Finally, he allows himself the pleasure, as he says, of "coming off the fence" in a discussion of the pathogenesis of hæmochromatosis. He concludes that it should be classed as an inborn error of metabolism affecting the inner metabolism of probably all the cells of the body (with the possible exception of nervous tissues), which shows itself by a disturbance of the metabolism of melanin and by the formation of iron containing pigment in nearly all the tissues. Neither of these pigments is peculiar to hæmochromatosis, and though the disturbance of metabolism is congenital in origin, he considers it does not produce of itself any disturbance of health, beyond initiating a process of cirrhosis in many organs and leading in time to accumulation of pigments, which ultimately give rise to the well-known triad of symptoms. In spite of the comparative rarity of hæmochromatosis, this scholarly study should interest workers in many fields, since the disturbance in iron metabolism appears to be accompanied by other profound changes in certain of the inorganic constituents of the body, notably copper, calcium, sulphur, sodium, and possibly magnesium.

The book is most carefully documented throughout, and completed with a bibliography of nearly 600 references. It can be recommended both to research workers and clinicians as a clear account of the present knowledge of a rare but key disease, an understanding of which should throw light on many aspects of the fundamental problems of cell metabolism.

A Textbook of Physiology

Fifth edition. By WILLIAM D. ZOETHOUT, Ph.D., Professor of Physiology in the Chicago College of Dental Surgery (Loyola University). London: Henry Kimpton. 1935. Pp. 694. 18*s*.

TEXT-BOOKS of physiology are usually dominated by the position of physiology in the medical curriculum, a previous knowledge of elementary biology, physics, and chemistry being taken for granted. Only in some of the larger "complete" text-books and the small popular works is the subject treated *ab initio*. The present volume furnishes an exception to this rule, for it is of medium size and yet quite general in its scope, and while it would be incorrect to say that no previous knowledge is required to read it, it is evident that considerable trouble has been taken to explain clearly that part of the subject known as "general physiology," and to provide introductory chapters on general biology and histology. This naturally detracts from the scope of the sections on the several systems of the body, particularly as they often need a short introduction, but these are well balanced in relation to each other and to the rest of the book, and sufficient references are given to monographs and reviews to put the student in a position to enlarge his knowledge.

Nowadays a considerable and growing interest in physiology is being manifested by many groups of students who have other objects than the practice of medicine as their aim, and to them this book may be recommended as a clear and comprehensive exposition of the subject, sufficiently detailed for ordinary purposes. Practical applications to everyday life, as in the sphere of nutrition, are indicated, and there are useful glossaries of technical terms, prefixes, and suffixes for those who might find the text difficult. It should be emphasised however that the book is not a "popular" work, but is intended for serious study by those "having a limited length of time for the acquisition of a basic knowledge of the subject," and is suitable for examination work. The text is generously illustrated, and in the main the figures are well chosen, the only criticism being that there are photographs and drawings of apparatus with which the student should be brought into personal contact, and which might therefore be considered redundant. The spelling, and in many places the terminology, is American.

The main features of the book may be summarised by saying that it is straightforward, of reasonable and convenient size, and complete in itself, neither introductory nor auxiliary—e.g., biochemical or special sense—texts being essential to supplement it.

Recent Advances in Laryngology and Otology

By R. SCOTT STEVENSON, M.D., Ch.B., F.R.C.S. Edin., Surgeon, Metropolitan Ear, Nose, and Throat Hospital; late First Assistant, Ear, Nose, and Throat Department, University College Hospital. London: J. and A. Churchill Ltd. 1935. Pp. 346. 15*s*.

Mr. Scott Stevenson says he has spent over five years in the preparation of this book; the outcome of his toil is a well-presented summary of modern work in oto-laryngology. Little has been included which could be called unworthy of classification as a "recent advance," though a more critical attitude would have been welcomed in places. At the end of each chapter is a paragraph of conclusions, but too often this is merely a summary of the preceding matter. The chapters on X ray and radium treatment of malignant growths are good. The broad general principles are well considered, and enough detail is given to illustrate the points. Those wanting to master the subject will find it necessary to study the original papers, as results are largely governed by attention to detail; it is therefore satisfactory that the references given are numerous and well chosen. In connexion with the radiological examination of the nasal accessory sinuses German workers have received less than their due recognition, but the work of the Americans is fully reported,

including Proetz's method. The author hardly lays sufficient stress on difficulties of interpretation; experienced workers find that X ray pictures must be considered in relation to operative and post-mortem findings if the fullest information is to be extracted from their study. The description of Ferris Smith's external ethmo-fronto-sphenoidal operation is too elaborate for a procedure whose rationale is far from established. On the other hand, the Proetz method of displacement treatment is too briefly dismissed. A warning in this chapter concerning unskilled nasal operating due to lack of training might have been amplified in general terms to cover the whole specialty. In this connexion some consideration of the organisation of research and teaching units in this country compared with those abroad would be valuable in a future edition.

Mr. Scott Stevenson has performed with some address the difficult task in reviewing the recent work on the physiology of hearing and the function of the labyrinth. The results reported in these fields are confusing, and it is a help to find the separate contributions of many research workers so ably sifted. The Wever and Bray phenomenon is clearly discussed, and the work in progress at Harvard and Johns Hopkins following upon this discovery is noted. McNally's experiments on utricular function are briefly described with his conclusion that the utricle acts in opposition to the contralateral vertical semicircular canals. The Ballance-Duel nerve-grafting method in the treatment of facial palsy has a useful chapter to itself.

Very few omissions of any importance can be detected. Some misprints will doubtless be corrected in future editions. The index is good and the book as a whole a most creditable production.

A Briefer General Psychology

By GARDNER MURPHY, Columbia University. New York and London: Harper and Brothers. 1935. Pp. 572. 10*s.* 6*d.*

THIS book shows admirably the links between physiology and psychology. It is clearly written, and the subject is developed in the simplest possible way. Those who have studied physiology will find many experiments described with which they have already become familiar, and will be interested in their interpretation from a new angle. Indeed, one would recommend the book with less reservation to medical students than to other readers, for not only will it harmonise with their other preclinical studies, but they will be in a better position to read it critically. The author claims, quite fairly, that he has presented only such material as furnishes common ground for the beliefs held by the majority of psychologists, but some physiological theories are taken too readily and accepted as facts on which to base certain conclusions. Nevertheless, no unreasonable interpretations are made, experimental evidence is introduced wherever possible, and this is not bent to the support of any particular "school." The aim of presenting only general principles is well maintained, but the scope of the various specialised branches of the subject—child psychology, social psychology, &c.—is indicated.

An unusual amount of trouble has been taken to help the serious student. The subheading of each section is given in the table of contents, illustrations are numerous and have exceptionally full legends, while references to other works and a summary are provided at the end of each chapter. The only feature unlikely to appeal to the English reader is the list of questions also appended to each chapter, an aid to learning usually found in less authoritative works and not in the tradition of university education in this country. The index is also a glossary, and is preceded by an extensive list of references to literature each relating to a statement in the text whose page, paragraph, and line is specified. The student is, therefore, not only encouraged to learn thoroughly, but also to investigate for himself. These features, together with the sane and interesting way in which the book is written, should carry it not only to the shelves of avowed students of psychology, but also to those of others who feel that an elementary knowledge of the subject is essential.

High Blood Pressure and its Common Sequelæ

By HUGH O. GUNEWARDENE, M.B., B.S. Lond., D.M.R.E. Cantab., Clinical Assistant, National Hospital for Diseases of the Heart, London, 1917–24. London: Baillière, Tindall and Cox. 1935. Pp. 172. 7*s.* 6*d.*

THIS is a good and clinically useful little book. The author rightly insists that it is the height of the diastolic rather than of the systolic pressure which is the true index of hypertension, the former being notoriously more stable than the latter. He regards a persistent diastolic pressure of 90 mm. Hg as the lower limit of abnormality and considers that if it rises to 115 it never returns to normal. He makes much of the hypertensive factor as a cause of heart disease and quotes the astonishing figures of Major and Fahr to the effect that there are 10 million persons with high blood pressure in America. Dr. Gunewardene states that when the diastolic pressure reaches 135 mm. Hg prognosis will have to be based on a general examination of the patient, but surely this is true of all cases of hypertension? The importance of differentiating renal from non-renal hypertension is emphasised and an excellent differential diagnosis table is supplied on p. 69. Like others, the author finds non-renal hypertension rare in those under 30 years old. In common with most pathologists and many clinicians, he disapproves of the term "malignant hypertension." Without going too deeply into ætiology, he believes that overfeeding and sedentary habits may be a causative factor in high blood pressure and makes out a good case for this hypothesis. Chapter V. contains an interesting piece of clinical observation on the influence of occupation and manner of living on the height of the blood pressure. In the author's experience, occupations involving more than ordinary physical exercise tend to produce blood pressures lower than normal. All would agree that prognosis is bad when retinal hæmorrhages and exudate are present, but the fact that solitary hæmorrhages which clear up may occur in cases of simple hypertension is not mentioned. Dr. Gunewardene has not seen strokes occur in patients with diastolic pressures of less than 115 mm. Hg. This is an observation deserving further inquiry. Chapter XV. contains a study of acute œdema of lungs which, apart from acute infections, is believed to be due often to persistent hypertension. In the chapter on prognosis he says that when cardiac failure or enlargement are present, strokes are less likely to occur—a statement difficult to prove. He believes that all cases of hypertension require treatment or, at least, medical supervision, and that when the blood pressure is raised attempts to reduce

it by natural means such as regulated exercise, dietetic restriction, and curtailment of business cares, should always be made. He thinks that the blood pressure can sometimes be lowered by the removal of septic foci and quotes O'Connor on prostatectomy as a means of lowering blood pressure raised as a result of renal damage in cases of prostatic enlargement. Dr. Gunewardene believes in the use of vasodilator drugs; when he condemns rigid systems of dieting he is, perhaps, on less controversial ground. On p. 73 the word "starving" is used when "fasting" is obviously intended. There is an adequate index but no bibliography.

A Textbook of Clinical Neurology

Third edition. By ISRAEL S. WECHSLER, M.D., Professor of Clinical Neurology, Columbia University, New York; Attending Neurologist, Neurological Institute and Montefiore Hospital. London: W. B. Saunders Co., Ltd. 1935. Pp. 826. 30*s*.

THE book has been thoroughly revised since the last edition and a number of minor and major clinical syndromes as well as new and old references have been added. It is perhaps impossible to attain to a completely satisfactory arrangement of the subject matter of a text-book of neurology, since nervous diseases may be considered from a nosological, pathological, anatomical, or physiological point of view. Dr. Wechsler adopts the anatomical arrangement, which has the merit of being traditional, though its drawbacks are exemplified in the treatment of amyotrophic lateral sclerosis and progressive muscular atrophy in separate sections in one part of the book, while pseudo-bulbar palsy and progressive bulbar palsy are treated in separate sections in another part. It is a pity, too, that subarachnoid hæmorrhage should be described in detail under the heading "Spontaneous meningeal hæmorrhage" in isolation from intracranial aneurysm which is its commonest cause. These, however, are minor defects in a book which gives a concise and up-to-date account of disorders of the nervous system. To deal adequately with the neuroses as an appendix to a book of organic nervous disease is perhaps, in the state of our knowledge, an impossible task. Dr. Wechsler draws largely upon Freud for his psychopathological theories, and Freudian perhaps more than any other psychological ideas suffer from compression and dogmatic statement. The clinical manifestations of the neuroses, however, are well described. A valuable new feature of this edition is an introduction to the history of neurology.

The book, which is well printed and illustrated, can be recommended especially to students.

Sex in Prison

By JOSEPH F. FISHMAN, formerly Inspector of Federal Prisons. Introductory Essay by ERNST TOLLER. London: John Lane, The Bodley Head Ltd. 1935. Pp. 256. 12*s*. 6*d*.

THE reader of this book is led to suppose from an introductory note about the author that he has an extensive first-hand experience of his subject; but the book itself conveys a different impression. Though Mr. Fishman writes with a delicacy which is perhaps intentionally absent from a short introduction supplied by Ernst Toller; though he has ideas about prison reform which, he declares, would appear advanced to American penologists, his account of the sex life of prisoners is superficial and repetitive. Much of the information is second-hand, and there are too many references to the works of sociologists and psychiatrists who have had no direct contacts with prison life. The book is entirely based upon American material, and deals almost entirely with men. It would have been more effectively written by a prison doctor of experience whose daily work brought him into intimate personal contact with prisoners.

The Spleen and Resistance

By DAVID PERLA, M.D., Associate Pathologist and Bacteriologist, Montefiore Hospital; and JESSIE MARMORSTON, M.D., Associate in Pathology, Cornell University Medical College. London: Baillière, Tindall and Cox. 1935. Pp. 170. 9*s*.

THE exact functions of the spleen in health and disease are ill-defined. Perla and Marmorston have made a gallant attempt to analyse the evidence concerning the importance of this organ in the mechanism of defence of the body to infection. They first review the normal anatomy of the spleen and the pathological changes occurring in infections, and then discuss its function as an organ of macrophage tissue, its rôle in antibody formation, and the effect of splenectomy in animals on natural resistance. They show clearly that splenectomy in many species of mammals converts a latent infection into manifest disease. The importance of this conclusion should be appreciated by workers in many different fields. It becomes, for instance, questionable, in view of the facts now collected, whether the spleen plays the rôle in hæmoglobin formation previously attributed to it; for this hypothesis was based upon a study of iron metabolism in splenectomised animals in which the presence of latent infection had not been excluded.

Though the impossibility of drawing definite conclusions must have made the writing of this monograph depressing, the authors will, without doubt, earn the gratitude of other workers for their painstaking and critical review of all available evidence.

The Foundations of Human Nature

By J. M. DORSEY, M.D., Associated Professor of Psychiatry, University of Michigan Medical School. London: Longmans Green and Co., Ltd. 1935. Pp. 488. 12*s*. 6*d*.

ON p. 30 of this book the author, who is associate professor of psychiatry in the University of Michigan Medical School, remarks that "the average man" is "only vaguely aware of the rich meanings and potentialities pervading the deep stirrings within him." And as he reads further the average man may congratulate himself in feeling that he has something better to do than wonder whether (p. 32) he "thinks and acts in harmony with the spirit of developmental history." In such wise the book goes on. The editor warns us that it will not make light reading. It certainly does not. The remarkable thing is that 400 pages of sheer wordiness lead to such excellent and familiar common-sense conclusions as that the best place for a child is where he loves the grown-ups and they love him, and that to be religious is to act naturally. But do these simple truths need so much rigmarole?

"The Biology of the Individual," by J. Ramsey Hunt and others, of which a review appeared in our issue of Nov. 23rd (p. 1182), is published in this country by Messrs. Baillière, Tindall & Cox.

THE LANCET

LONDON: SATURDAY, DECEMBER 7, 1935

THE RENAISSANCE OF MEDICINE

"The aims of medical science . . . are to increase and perfect our knowledge (with a view to its control) of disease in man, and equally our knowledge of man in disease, by every legitimate means of science and art at our disposal."

THIS definition is taken from the inaugural lecture delivered on Nov. 26th by the new regius professor of physic at Cambridge, and already available, attractively produced, in book form.[1] Prof. RYLE is satisfied that the vast majority of honest workers, whether at the bedside or in the laboratory, subscribe to this ideal of medical science; excepting only those few who have made a trade of their art or who through some combination of mental peculiarity and faulty education indulge in cranks, or develop a fixed idea not in accord with ascertained facts. His further contention, that many who have the proper aim in view exhibit defective standards of accuracy and of judgment in interpreting evidence, is not likely to be disputed, though the proportion of the whole profession to which these criticisms are applied will vary with the prejudices of the commentator. While none regret the passing of the convention of infallibility at one time fashionable among physicians, some hold that the habit of mind that refuses to recognise failure and bases practice on the memory of successes that may well have been fortuitous has its uses, and can be disturbed only at the risk of still further diminishing efficiency by damaging self-esteem. That the "scientific" critic of the medical practitioner tends to take little account of the hourly need to comfort and cheer the patient makes it easy to ignore or even to ridicule his comments. But when such strictures receive corroboration from one who, like Prof. RYLE, is well aware of the dangers of discouragement at the present stage of medical practice, it is well to take notice. He wastes no abuse on those "whose judgment is continually crippled, rather than gradually amended, by the inherent difficulties of their subject and the exacting conditions of their lives" but seeks to ascertain to what primary errors their shortcomings are due. His verdict is, briefly: (1) faulty selection of men, or misdirection of their energies after qualification; (2) complicated and unwieldy systems of education and examination; (3) the spread of the cult of specialism. It is with the last error that he is here concerned, condemning, of course, only excessive, premature, and misdirected specialism and the lack of a central controlling philosophy to hold the reins of the restive younger sciences. Mingled with countless examples of good and wise industry, his practice has brought all too frequently before him—

". . . instances of operations unnecessarily undertaken or advised, of treatments injudiciously selected and forecasts unfairly given, not because of the inherent difficulties of medicine which tax us all, but simply because the nature and meaning of common symptoms have been insufficiently appreciated; because new machines and tests have been allowed to usurp the function of eye, or ear, or hand, or native wit; because the psychology of a patient has been misread or neglected in the previous estimates; or because he or she has never been viewed as a "whole" man or woman, and the disease never studied as a "whole" disease. All too commonly the puzzled practitioner has been persuaded into unwise diagnosis or action by a laboratory or radiological opinion unjustified because it has been given without reference to or knowledge of the general situation, which includes both organism and environment, part and whole."

What steps can be taken to restore a balanced outlook, and to promote healthy, well-directed, and correlated specialism rather than isolated pigeon-holed research by men whose initial education has lacked breadth and who are deprived by the divorce of ward from laboratory of the stimulus they most need? In seeking an answer to this main problem Prof. RYLE examines some of the recent achievements in medicine, notably those of BANTING, MINOT, LAIDLAW, and LEWIS. He finds that commonly the clinician has made himself his own experimentalist or that the collaboration between experimentalist and clinician has been so intimate that they may almost be said to have worked with one mind. In a modest reference to his own part in the investigation of spirochætal jaundice by ADRIAN STOKES during the war he points out the close association between pathologist and clinician. "Stokes was in my ward and I was in his laboratory day by day. He saw my cases. I saw his guinea-pigs." The disease in man and the experimental animal were critically compared; observations were shared, the material and work were concentrated in one place, and results and proofs followed speedily. Such favourable opportunities for problem-sharing can hardly be provided in the hospitals of great cities as at present organised; nor has Prof. RYLE confidence that the appointment of whole-time research physicians necessarily brings in its train facilities for intimate collaboration with other scientific departments. It is thus the university with a flourishing medical faculty and a well-equipped hospital that he regards as the most hopeful soil for the culture of clinical science. Where there are already assembled anatomists, physiologists, pathologists, and biochemists, and the finest facilities for teaching and research, it is only reasonable that the circuit should in due course be completed by an active department of clinical medicine. The unit here visualised is not designed for the instruction of undergraduate students but for the provision of opportunity, guidance, and material for the training of small

[1] The Aims and Methods of Medical Science. By John A. Ryle, M.A., M.D., F.R.C.P., Regius Professor of Physic in the University of Cambridge; Consulting Physician to Guy's Hospital, London. Cambridge University Press. 1935. Pp. 44. 2s.

selected groups of young qualified men. No attempt is made in this inaugural lecture to enumerate the possible interests and functions of such a department, but it is indicated that the study of symptoms, their nature and their purpose, by more precise methods should be a main consideration; that intensive and continuous study of common diseases should generally be preferred to isolated research on rare ones; and that therapeutic trials might constitute a practical service. The more accurate portraiture of diseases, improvements in diagnostic and prognostic methods, and studies of innate predisposition would provide appropriate tasks, with a follow-up system as an essential element of the scheme. Incidentally the services of the department to the hospital could only be stimulating and salutary; there should be no artificial separation between its functions and those of the visiting and resident staff, whose members would in fact complete the unit.

Prof. RYLE's fine conception of clinical science, which he recapitulates, is already known to our readers.[2] It differs from that of Sir THOMAS LEWIS[3] mainly in the relative importance attached to observational as opposed to experimental methods. We are reminded (as LEWIS indeed freely admits) that there are necessary and rather strict limits to the possibilities of experiment in sick persons; it is pertinent to refer back to the words "by every legitimate means" in the definition quoted above of the aims of medical science, for it is our pride in this country to interpret them in a most rigid sense. Moreover, as Prof. RYLE points out, the types of disease which at present lend themselves to clinical experiment are few in number; it is rarely possible to reproduce, to vary, or to measure symptoms at will. But apart from these limitations of the experimental method in the human subject, it is clearly Prof. RYLE's conviction that precise and intensive methods of observational study are not yet and will not soon be exhausted. This message commands attention. We cannot doubt that it will receive it; that he will be offered scope to develop his ideas at Cambridge as facilities become available, and that his school will do its share in making "the ward, with its associate out-patient clinic and laboratories, once more both the starting and the rallying point of many researches."

STREPTOCOCCI AND PUERPERAL INFECTION

HÆMOLYTIC streptococci are found much more often in carriers than in cases of acute infection; indeed, no other organism shows so high a disproportion between carriers and disease. This fact, and the immense variety of infections for which they are responsible, have been the chief reasons for suspecting that all cocci rightly to be described as *Streptococcus pyogenes* are not the same. Hence the evolution of an increasingly complex series of tests whereby it was hoped to classify pathogenic types, and to differentiate from them others of less or no importance in human disease. Having qualified for serious consideration on morphological and ordinary cultural grounds, a streptococcus passes into a more select though still extremely wide category by being shown to form a soluble hæmolysin, and is then examined as to its capacity to lyse fibrin, to ferment a series of carbohydrates, to hydrolyse sodium hippurate, and to grow in the presence of bile. The wider a range of tests of this kind, the more impracticable does their routine performance become and the more confusing their results. Carried out in toto on a large series of strains, these tests have afforded useful indications; but individually their value is limited.

Serological study has met with even greater difficulties, and years of effort have gone to the definition by GRIFFITH[1] of no less than 27 types distinguishable by agglutination tests. Of the ultimate individuality of a streptococcus this method is and will probably remain the only criterion; by no other means is it possible certainly to identify the source of an infection and to trace the spread of an epidemic strain. But few workers are in a position to apply this method, and its large-scale application involves immense labour. What is needed for many purposes is some cruder test, easy of application which will clearly distinguish strains highly pathogenic for man from those which are not. This requirement is met by the precipitin test of LANCEFIELD,[2] which relegates hæmolytic streptococci into a small number of groups (now unfortunately showing signs of considerable extension) among which strains causing serious infections in man fall always into Group A. Results obtained by this method correspond with those of the elaborate series of biochemical tests formerly in use, and seem competent to replace those tests altogether. An opportunity is thus afforded to restudy the distribution of hæmolytic streptococci in carrier sites with much more significant results. Some useful spadework in this direction is reported in a series of papers from Queen Charlotte's Hospital, where the exclusive significance of Group A in relation to serious puerperal infections has previously been verified. A large number of strains from throat carriers has been classified by Dr. HARE,[3] who finds that of streptococci from this source about a third belong to Group A; or if only those strains are included which have been shown to form soluble hæmolysin, two-thirds. Dr. HARE and Dr. MAXTED[4] have also investigated the possibility that dangerous streptococci may be present in the fæces, a doubtful question of the utmost practical importance in seeking to explain the origin of puerperal sepsis. They found no Group A strains in the fæces of 100 normal parturient women, but recovered them from the fæces of 20 per cent. of cases of scarlet fever. It is therefore apparently possible for streptococci in the throat to reach the anus alive, although uncertain in what numbers or under what

[2] THE LANCET, 1934, ii., 1307.
[3] Brit. Med. Jour., 1930, i., 479. "Clinical Science, illustrated by Personal Experiences." London. 1934.

[1] Griffith, F.: Jour. of Hyg., 1935, xxxiv., 542.
[2] Lancefield, R. C.: Jour. Exper. Med., 1933, lvii., 571.
[3] Hare, R.: Jour. Path. and Bact., November, 1935, p. 499.
[4] Hare, R., and Maxted, W. R.: Ibid., p. 513.

conditions. It seems desirable that the fæces of a series of throat carriers should be repeatedly examined in order to get further light on this possibility. According to COLEBROOK, MAXTED, and JOHNS,[5] no Group A strains were found on the perineal or peri-anal skin of 160 women—another piece of evidence suggesting that the bowel is an unlikely source of infection, although here again the bacteriological state of the throat was not actually known. In these studies, of course, the delicacy of the cultural technique is all-important; improved technique, if such is possible, might reveal the presence of small numbers of streptococci more frequently. In this paper it is reported, on the other hand, that Group A strains were found on the skin of the hands in 7 out of 181 normal persons (3·8 per cent.); their presence in this situation is attributed (reasonably, but without actual evidence) to contamination from the upper air-passages, and since the genital tract may thus hypothetically be infected from the throat by a route other than the alimentary canal, it is suggested that measures should be taken to disinfect the mother's hands during labour. This is perhaps an example of those more extreme precautions which do not find favour generally, and indeed may defeat their object by arousing ridicule, if only among less serious students of this difficult problem.

While bacteriologists pile up large volumes of data bearing on the ætiology of puerperal sepsis, obstetricians are still by no means of one mind on this matter, and there are many who still disregard aerial infection and deny the throat the all-important place given it in these papers as a reservoir of infection. We publish on p. 1287 an article by Dr. PHYLLIS CONGDON which offers further evidence that the source of puerperal infections is sometimes the throat of someone attendant on the patient. Her results differ from those of previous workers in the frequency with which a strain of streptococcus identical with that in the uterus was found in the throat of the patient herself; it should be pointed out that this does not necessarily mean auto-infection, since both throat and uterus may have been infected from elsewhere. Do findings such as these constitute a sufficient case for a bacteriological overhaul of all attendants, and prospective attendants, on women in labour, and the exclusion of those found to be carrying Group A streptococci? This proceeding would certainly have some very inconvenient results.

THE EXAMINER AT BAY

DURING the last century examinations of innumerable species, created by private and public bodies, have sprung up here, there, and everywhere, and have grown so luxuriantly that they overshadow not only our education but the social system of our country. Examinations form a barrier between elementary and secondary education, between secondary education and the universities; they confront the aspirant to professional and many business careers. How far do they let through the right people? This is a question that troubles both teacher and parent, examiner as well as examinee. The latter is apt to feel that the system is one which does not do justice to his abilities; that Mr. Smith, for instance, can win approval by means of his retentive memory, whereas he, Mr. Jones, lacking that faculty, is unable to demonstrate his innate superiority in mental power. But another question, of at least equal importance, to which less attention has been paid, is this: does the fate of Smith or Jones depend to any appreciable extent upon the inevitable variability between the opinions of different examiners, or upon the variability of the same examiner at one time and another? If an examiner considers Jones worthy of first-class honours in 1935, would he place him in precisely the same category if presented with exactly the same answers in 1936? If one examiner is of opinion that Smith must be ploughed, will that opinion be endorsed by others equally competent? In fact, how far does the element of chance enter into the results of our public examinations? Into this question exhaustive inquiries are now being made. As the outcome of an International Conference on Examinations held at Eastbourne in 1931, committees were set up in England, France, Germany, Scotland, and Switzerland, their investigations being financed by grants from the Carnegie Corporation through the International Institute, Teachers College, Columbia University, New York. The English committee, which comprised distinguished professors of education and psychology, was presided over by Sir MICHAEL SADLER, and Dr. E. C. RHODES, reader in statistics at the London School of Economics, was engaged to act as their statistician. Their main work is being recorded in a volume entitled "The Marks of Examiners," now in course of printing, but the principal results of the investigations are shown in summary form in a pamphlet issued this week.[1] The position revealed, as shown by what follows, is, to say the least of it, very disquieting.

The methods of inquiry adopted appear eminently satisfactory. The scripts investigated were all actual scripts which had been written by candidates in the course of an ordinary examination—e.g., for School Certificate, a college scholarship at one of the older universities (English essay), and an honours degree (mathematics and history). The examiners by whom these papers were marked were all persons with experience of the kind of examination investigated, and they were able to mark the papers under less pressure in respect of time than ordinarily prevails at an examination, so that the marks may be regarded as expressing their deliberate opinion. Furthermore they were all paid, so that the conditions were as near reality as possible. As examples of the results reached the following may be quoted. When fourteen experienced examiners re-marked independently fifteen School Certificate history

[5] Colebrook, L., Maxted, W. R., and Johns, A. M.: Ibid., p. 521.

[1] International Institute Examinations Enquiry. An Examination of Examinations by Sir Philip Hartog, K.B.E., C.I.E., and E. C. Rhodes, D.Sc. London: Macmillan and Co., Ltd. 1935. 1s.

scripts, which had all received the same "middling" mark by the School Certificate authority concerned, they allotted no less than 43 different marks varying from 21 to 70 (out of a maximum of 96). But worse was to follow. The same papers were re-marked by the same examiners (excluding one) 12–19 months later. It is stated that they gave assurance that they had kept no record of their previous work, and, as the authors caustically add, "this was indeed obvious from the results." For on each occasion the examiners gave a verdict of Failure, Pass or Credit, and in 92 cases out of the total 210 the individual examiners gave a different verdict on the second occasion from the verdict awarded on the first! In 9 cases candidates were moved two classes up or down, while one examiner changed his verdict on 8 candidates out of 15. It seems likely that such extreme variability might be reduced by the construction of a board of examiners with an agreed and detailed marking scheme, and this plan was tested with various School Certificate papers as basis. For example, with French, two 2-hour papers were marked by two boards of examiners, the first board (A) having adopted 5 general directions and 640 detailed directions for Paper I. and 290 detailed directions for Paper II. The scheme of Board B included 700 detailed items for Paper I. and 300 for Paper II. In spite of these complex schemes the returns of the individual examiners showed that the number of Failures varied from 6 to 15, of Passes from 7 to 16, of Credits from 21 to 30, and of Distinctions from 1 to 9. Agreement was reached between the six examiners of Board A on the awards to only 27 candidates out of 50, and between the examiners of Board B in regard to only 30 out of 50. Similar results, though somewhat less discrepant, were reached with chemistry papers. With English papers seven examiners were employed. There was only 1 candidate out of the 48 to whom all seven examiners awarded the same class. One examiner ploughed 19 candidates, while two ploughed none; one gave 12 special credits and three gave none. On one paper a candidate was ploughed by six examiners and awarded a credit by the seventh. Even with a university mathematical honours paper the range of marking is considerable. With six examiners marking the same scripts the range of marks awarded, out of a maximum of 300, ranged for particular candidates from 81 to 145 and from 118 to 175—i.e., from a certain plough to a probable pass, while other candidates vary in the honours that they would have been awarded.

A particularly interesting experiment involved a viva-voce examination, of the type used in Civil Service examinations to test "alertness, intelligence, and general outlook." For this purpose two boards of examiners were set up, consisting of persons of experience, used to judging candidates by interview. Applications were invited from university students, aged 21–23, certified by the university authorities to be suitable as candidates for the junior grade of the administrative class, Home Civil Service (this is the technical name for the appointments of the highest grade in the Home Civil Service, open to competition). To ensure an adequate stimulus a prize of £100 was offered on the results of the viva-voce examination. Sixteen candidates were thus individually examined by each of the two boards for 15–30 minutes each. After the interview each examiner recorded the mark (out of a maximum of 300) that he or she would personally award, and that having been written down the board agreed upon a mark representing the view of the whole board. The results of this very careful experiment show not only wide differences of opinion between the individual examiners but between the boards. The candidate placed first by Board X was placed thirteenth by Board Y, and the candidate placed first by Board Y was placed eleventh by Board X. The extreme differences between the two boards' estimates of the candidates' merits point, the authors are driven to conclude, to the unreliability of the interview test. Sir PHILIP HARTOG, who was present as an "impartial and silent observer" at the proceedings of the two boards, formed the opinion that while they were equally skilful in cross-examining in such a way as to reveal the weaknesses of candidates, it was largely a matter of chance whether they struck on a topic about which a candidate felt so strongly that he was able to display his individuality. The lucky recipient of the £100 (and the results of the test suggest we must stress the word *lucky*) was placed second by one board and fourth by the other.

To what conclusions does this important piece of work lead us? It is clear that the part played by chance in the verdicts given at different examinations on which careers depend must often at the present moment be a great one. No doubt the consideration of borderline cases by examination authorities does materially diminish the chances of a candidate being wrongly rejected, but it appears from this report that some candidates may be placed in error below the borderline, and thus their case is never reviewed, while others may win certificates of efficiency when they should by rights have been rejected. The employment of boards instead of individual examiners diminishes the element of chance but does not remove it. Then should examinations be abolished? The committee definitely think not. They believe that as a test of efficiency the system is necessary, but that only by careful and systematic experiments can methods of examination be devised "not liable to the distressing uncertainties of the present system. No doubt investigations like those recorded by our committee, and administrative experiments in allowing teachers, in conjunction with Government or university inspectors, to 'brand their own herrings,' would involve expenditure, but such expenditure and experiments would be justified in the public interest." The present report must give everyone engaged in the conduct of examinations furiously to think, and in the interests both of the examined and the examining it is to be hoped that the further experimental work the committee plead for will be developed.

ANNOTATIONS

A FOOD POLICY

Is not the time ripe for the initiation of a comprehensive national food policy? was the question asked by Sir Gowland Hopkins in his presidential address to the anniversary meeting, last Saturday, of the Royal Society. That underfeeding and ill-feeding exist he was sure, although he admitted the difficulty of measuring their extent, and after a diligent study of available evidence he was left with the impression that the situation called for further and immediate action. It seems that the Expert Commission on Nutrition, appointed by the League of Nations, which held its first meeting in London last week [1] under the chairmanship of Prof. Edward Mellanby, drew up a list, in order of priority, of the problems for future study at various scientific institutes, with a view to practical progress. This is the first time that nutrition has been dealt with at an international conference by European and American authorities, and the members of the conference will remain in touch with each other through the Health Organisation of the League of Nations. The League of Nations Council has appointed a joint committee for the study of the problem of nutrition, which is to present a general report to the Assembly in 1936, and the report of the London Conference, expected at the end of this week, will be transmitted to this joint committee, whose first meeting will take place early next year. The experts who have drawn up the present report will be represented by their chairman, Prof. Edward Mellanby, and Prof. E. V. McCollum; or, if either of these is prevented from attending, by Sir John Orr or Prof. Mary S. Rose.

SMALL-POX AND ALASTRIM

THE relationship of alastrim to variola major still remains puzzling despite a very considerable body of work on the matter. The subject is not one of merely academic interest; it constitutes a major problem in public health. Although there are certain clinical differences between the two diseases, the identity of the two viruses seemed established by laboratory workers by means of animal inoculations, allergic tests, and serological investigations. The question of differentiation is, however, one of great complexity, as it concerns the antigenic structures of the two viruses. This relationship is linked with that of vaccinia. Additional data from the morphological standpoint have been provided by the studies of Dr. C. Magarinos Torres, of Rio de Janeiro, which have appeared from time to time during the last few years in the *Comptes Rendus* of the Paris Société de Biologie. These data formed the main subject of his Lloyd Roberts lecture delivered before the Royal Society of Medicine last week and briefly reported in our columns (p. 1236). Differences are stated to exist in the histological appearances of variola and alastrim, and, in especial, of the inclusion bodies within tissue cells produced by these diseases. Unfortunately the nature of such bodies, whether of the typical Guarnieri type or not, cannot be regarded as established. The commonly accepted view is that they are the products of tissue-cell reaction to the influence of infection by the virus. In the opinion, however, of E. W. Goodpasture and his co-workers,[2] studying the lesions on the chorio-allantoic membranes of chick embryos produced by vaccinia of neurotesticular origin, there was evidence that the Guarnieri bodies represent, in part at least, colonies or masses of elementary (Paschen) bodies. It is prudent therefore to suspend judgment on the significance of Dr. Torres's observations. The pathological findings in alastrim are valuable and the lecture should stimulate research into the histology of this disease, and particularly research into the nature of the inclusion bodies associated with the tissue changes in all three linked viruses.

BLINDNESS IN THE U.S.A.

IT is not easy to make a statistical survey of the causes of blindness in any country, and Mr. Harry Best shows us in his book [1] that the difficulties in America are exceptional. The survey, to be of practical service, must include those with considerably more vision than bare perception of light, and it is by no means easy to draw the line between the blind and the partially blind. Moreover, in America, each State has its own regulations concerning blindness, and naturally these differ. The attempt to compile elaborate and detailed statistics applicable to the United States as a whole would therefore appear to be futile. The proportions of blindness due to different causes can only be stated roughly, but taking the main categories they appear to be approximately the same in America as in England, with the tendency to change in the same direction. For example, blindness from ophthalmia neonatorum is diminishing owing to greater care in prophylaxis. The incidence of trachoma is now small except among the Indians. At early ages congenital cases form a considerable proportion of the blind; in middle life accidents loom large, and in later life the main causes of new cases are cataract and glaucoma. In this connexion it would be interesting if it were possible to trace the effect of improved operative treatment on the statistics of blindness, but as far as we know this has not been attempted.

Taking the United States as a whole, about half of the total blind population are supported either by their own private means or by their families, relatives, and friends. The total amount of relief from almsgiving or organised charity is not assessed. A few of the blind are cared for in special homes, and the most frequent form of public relief is maintenance in almshouses, where about 6 per cent. of the total number of blind are provided for. In some States pensions for the blind exist under the direction of the several counties with more or less of State supervision.

The problem is still in the experimental stage, being in the hands, not of the Federal Government, but in those of the various States. On the whole public economic assistance to the blind in the United States appears to be less systematised than in England where progress in this matter has been steady since the passing of the Blind Persons Act in 1920. Schools for the blind were opened about a hundred years ago in Boston, New York, and Philadelphia, and other States gradually followed. Their origin was due to private initiative, but it was not long before Government grants were obtained. Since 1920 State schools for the blind exist in most States, and it is estimated that three-quarters of the blind population between the ages of 5 and 24 are

[1] THE LANCET, Nov. 30th, p. 1270.
[2] Goodpasture, E. W., Woodruff, A. M., and Buddingh, G. J.: Amer. Jour. Path., 1932, viii., 3 and 271.

[1] Blindness and the Blind in the United States. By Harry Best. New York: The Macmillan Company; London: Macmillan and Co., Ltd. 1935. Pp. 714. 28s.

educated in these. In the large cities a few ordinary day schools have special classes for the blind but, on the whole, owing to the absence of any compulsion, in many States the education received is, according to Mr. Best, not very satisfactory. Until comparatively recently various systems of raised type were employed, but in 1916 a satisfactory system of Braille was adopted by the American Association of Instructors for the Blind and is now general. Besides oral instruction and the acquirement of Braille reading, physical training is especially important. Musical instruction always occupies a prominent place in the work of the schools, and a number of piano tuners are turned out. Industrial training includes sewing, knitting, chair-caning, brush- and rug-making, basketry, carpentry, and cooking. An interesting section deals with the blind workshop movement, and there are others dealing with indemnities paid for loss of sight through suits at law, through insurance, and through Workmen's Compensation laws.

BIOPSY OF STERNAL MARROW

IT is said that Türck, when questioned about the pathology of a certain "blood" disease, haughtily replied: "Sir, I am a peripheral hæmatologist." To-day few people are rash enough to make a diagnosis in obscure cases without some knowledge of the character of the hæmopoietic tissue; and recent observations show that such knowledge may well be gained during life by the method of sternal marrow puncture. Dameshek [1] and also Young and Osgood [2] have lately reviewed large series of cases studied in this way. Dameshek obtained his marrow by means of a special small trephine enabling him to prepare both smears and sections, while Young and Osgood removed through a lumbar puncture needle enough marrow to make smears. The results of the two methods seem to agree closely. Many conditions presenting anæmia as an outstanding symptom fail to provide signs, either clinical or hæmatological, that allow of an exact diagnosis. This is particularly true of aleukæmic myelosis. Thus, if a large spleen is found in patients with anæmia and leucopenia, splenic anæmia is usually diagnosed. If the anæmia is megalocytic, pernicious anæmia is accepted as a diagnosis; if petechiæ and hæmorrhages are present, thrombopenic purpura is considered; and if there is a conspicuous leucopenia with few neutrophils, agranulocytosis is suggested. In such cases of obscure anæmia associated with leucopenia and thrombocytopenia, bone-marrow biopsy frequently shows that the marrow may be extremely cellular, though the peripheral blood itself is almost devoid of white cells. "Agranulocytosis," which fails to respond to pentose nucleotide, is often, probably, aleukæmic leukæmia; many cases of "pernicious anæmia" which do not improve on liver fall into the same group; while Dameshek found that the great majority of a series of cases diagnosed as Banti's disease should on biopsy examination be grouped as aleukæmic leukæmia. Apart from its value as a diagnostic aid, the examination of marrow smears should give us information useful on a more academic plane. For example, Osgood and Young were able to demonstrate numerous stippled red cells in a case of lead-poisoning, whereas Aub and his associates had previously claimed that stippling is not seen in marrow cells, and is therefore, at least in lead-poisoning, a sign of degeneration. It is clear that biopsy studies of sternal marrow, if undertaken by observers with considerable experience of the appearance of normal marrow, will be a valuable addition to the more usual technique of "peripheral hæmatology."

[1] Dameshek, W.: Amer. Jour. Med. Sci., November, 1935, p. 617.
[2] Young, R. H., and Osgood, E. E.: Arch. Internal Med., 1935, lv., 186.

RENAL CORTICAL NECROSIS IN PREGNANCY

DIFFUSE and almost complete symmetrical necrosis of the renal cortex is fortunately rare among the complications of pregnancy. Few pathologists have seen more than two or three examples, and its pathogenesis is still obscure. Dr. S. De Navasquez's histological study [1] of a series of 15 cases—3 from Guy's Hospital and the remaining 12 collected from other sources—has given him an opportunity of detecting and bringing into prominence what appears to be the essential histological lesion. His analysis shows no evidence of a pre-existing nephritis. The changes, which closely resemble those of anæmic infarction, must be referred to a vascular mechanism; and here it is of importance that De Navasquez discards the theory of local thrombosis both from the structure of the vessel contents—which, he says, are no more than conglutinated red and white corpuscles without fibrin or platelet deposition—and from the study of two early cases in which these so-called thrombi were absent. On the other hand, he finds that a variable degree of necrosis of the intralobular arteries and their branches can be detected and regards this as the primary change in these kidneys. Comparison shows that it is distinct from the necrosis that inevitably takes place in the walls of vessels included in areas of true renal infarction. It is of interest that De Navasquez finds identical histological changes in the specimens from a case of dioxane poisoning supplied by Dr. H. Barber. This is perhaps the only agent of known chemical composition that has as yet been shown to produce bilateral diffuse cortical necrosis of the kidneys; it is certainly not known how such necrosis is produced in pregnancy. De Navasquez states, however, that it has been caused experimentally in rabbits by means of bacterial toxins and that we may expect a future communication upon the results of this work.

URINARY INFECTIONS OF THE NEW-BORN

IN the first week of life it is not uncommon to find a baby feverish and passing very little urine. The condition will often respond quickly to extra fluid by mouth or (if there is already anuria) intravenously. How many of these cases represent a primary disorder of the urinary apparatus and how many the so-called "dehydration fever" it is hard to say. Dr. W. S. Craig [2] does not mention the latter possibility; but his general study of urinary infection in the new-born is one which deserves attention. First he determined normal standards by examining 200 specimens of ordinary urine from healthy non-febrile infants between the ages of twelve hours and fourteen days. In 163 of these no cellular or other solid elements could be discovered; in the remaining 37 epithelial cells were the commonest finding, and in 10 there were polymorphonuclear leucocytes, never in greater number than one in 10–15 high-power fields. Of 43 catheter specimens examined bacteriologically, 7 gave isolated discrete colonies of *Bacillus coli* on culture, and 3 gave sparse growths of other organisms. In contrast to these normal findings Craig gives the results of examination of the urine

[1] Jour. Path. and Bact., November, 1935, p. 385.
[2] Arch. Dis. Childhood, October, 1935, p. 337.

of 61 infants considered on clinical grounds to have some disorder of the urinary tract. Numerous pus cells were present in 48 cases (5–140 per field) and organisms were sometimes found in those without pus cells; the urine contained casts in 14 cases and there were 7 with a mixed infection. That briefly summarises the pathological findings. Clinically the chief features—roughly in order of frequency—were fever, anuria, or a big decrease in urinary output, thirst, restlessness and irritability, changes in colour to a dusky-grey, sweating, vomiting, œdema, collapse, and terminal convulsions—the last occurring in 10 per cent. of cases. Of the 61 children, 9 died never having left hospital, but recovery was apparently complete in all the others. More males were affected than females—40 as against 21—which is in contrast with the findings in later life. Without offering any final solution of the problem Craig thinks that the symptoms at any rate are closely related to the excretory activity of the kidneys, and that the paucity and high concentration of the urine ordinarily passed in the early days of life may make infection easier. Treatment is directed towards promoting free diuresis. Provided there was no collapse and the general condition of the child remained good, feeding was allowed to proceed normally. Extra fluids in the form of water or weak tea were given between feeds; in the presence of collapse or high fever they were given at hourly or half-hourly intervals, and milk was temporarily excluded. Alkalis were administered as sodium or potassium citrate with an initial dose of 16–20 grains in twenty-four hours. This was usually enough to make the urine alkaline, but larger doses were sometimes needed; subsequently the dose was adjusted to maintain alkalinity. The bowel function was treated by an initial dose of castor oil (30 minims) and bowel lavage if the motions were fœtid; and local warmth was applied to the lumbar region. Among the babies whose career was followed after discharge many were found to pass *B. coli* and pus for several weeks after all symptoms had disappeared.

STANDARDISATION AND ESTIMATION OF VITAMIN A

THE success of the International Conference on Vitamin Standardisation, held in London last year, was largely secured by careful preparation in this and other countries. This preparation involved much experimental work of the sort in which parallel tests are made in several laboratories with the same material. Such investigations have to be coördinated, and this was done in Great Britain by a subcommittee for each vitamin, appointed by the Accessory Food Factors Committee, which is itself appointed jointly by the Medical Research Council and the Lister Institute. Corporate studies of this kind are very difficult to publish. The contribution of a single worker or laboratory is often quite inadequate when described by itself, or at any rate loses much weight by standing alone. On the other hand, if all the contributions are collected and published together, the attempt to harmonise them may be almost hopeless. In the latest special report of the Medical Research Council [1] such an attempt has been made for the experimental work done by British workers in connexion with the international standard for vitamin A. Studies from different laboratories are collected, and it has proved possible to weld them into a reasonably coherent form. They included a search for a suitable solvent for the crystalline carotene, acting as the international standard. This solvent had to be one in which the carotene remained stable and from which it was well utilised by the experimental animals. Coconut oil with added hydroquinone was selected. Then it was necessary to ascertain the biological value of pure β-carotene, which was recommended as international standard to replace the impure mixture of carotenes which was provisionally adopted as standard by the first conference in 1931. This was a very important value which could be ascertained only by a biological test. The error in such biological estimations is great and there was corresponding advantage in having a value based on the results from several laboratories. In some substances, such as cod-liver oil, there is no carotene, the only source of vitamin-A potency being the vitamin itself. A spectroscopic method of estimating vitamin A in such material had come into use and the report includes joint studies on the reliability of this test and on the factor which should be used for converting the results of the spectroscopic test into international units of vitamin-A potency, as determined by the biological test. A figure for this factor was fixed, and adopted by the conference—perhaps rather prematurely. The report also contains studies on cod-liver oil as a subsidiary international standard for vitamin A, in addition to β-carotene. This section includes some interesting comparative figures in which biological tests for vitamin A were made on the same material not only in this country but also in American and several European countries, and good agreement was achieved. Finally it reproduces in full the report of the International Conference on Vitamin Standardisation, which is not very easily accessible otherwise. It is gratifying that the recommendations arising from the corporate studies reported in this book were embodied in the decisions of the conference.

[1] Reports on Biological Standards. IV. The Standardisation and Estimation of Vitamin A. Edited by E. M. Hume and H. Chick. Med. Research Council, Spec. Rep. Ser. No. 202. London: H.M. Stationery Office. 1935. Pp. 61. 1s.

HEDGEHOGS AND THE COMMON COLD

THE search continues for an experimental animal susceptible to the common cold. Human volunteers and chimpanzees, while definitely susceptible, cannot be used to solve most of the major problems of the disease. Interest attaches, therefore, to a preliminary communication made by Mr. J. T. Edwards, D.Sc., to the meeting of the section of comparative medicine of the Royal Society of Medicine held at the Lister Institute on Nov. 27th. Observations on foot-and-mouth disease formed the starting-point of his studies; the virus of this disease will infect hedgehogs by the intranasal route and causes in them a high mortality. As the virus is passed in series, the rôle of secondary invaders, such as pasteurella, salmonella, and particularly *Bacillus bronchisepticus*, becomes more prominent. The virus, in fact, activates the normal nasal flora of the hedgehog and this may lead to the animal's death from bronchopneumonia or septicæmia. "It was possible," argues Edwards, "that if material derived from cases of common cold contained a filtrable virus, this virus might in a similar way be found to prepare a way for certain subpathogenic bacteria on the nasal mucosa of the hedgehog to obtain a foothold, multiply, and set up catarrhal lesions." Filtered and unfiltered secretions from three cases of acute coryza in man were inoculated into hedgehogs under ether anæsthesia, and Edwards reports that a number of animals showed an increase in their nasal discharge after inoculation, and that in some of them catarrhal

lesions were found histologically in the mucosa covering their turbinates. *B. bronchisepticus* was the organism most commonly recovered from affected hedgehogs. Broth and "heated cold filtrate" did not produce comparable effects. Passage in hedgehogs was apparently successful for three serial transfers.

At the same meeting Dr. C. H. Stuart-Harris said that in consultation with Dr. Edwards he had been carrying out similar experiments at the National Institute for Medical Research at Hampstead. He was able to confirm the fact that hedgehogs inoculated intranasally with common-cold secretions develop an increased nasal discharge. He hesitated, however, to conclude at this stage that the effect was a specific one, for three reasons. First, normal hedgehogs show great variation in the amount of their nasal secretions; secondly, he had suggestive evidence that inoculation of *B. bronchisepticus* alone could increase the amount of secretion; and, thirdly, he had been unable to correlate the amount of discharge with the histological findings.

This line of approach to the common cold is an interesting one, but the interpretation of the results must be much more difficult than in most work on viruses, for variation in the nasal flora of hedgehogs is a factor very difficult to control. The results must therefore be regarded with great caution, indicating at most that further work along these lines is desirable. It may be added that as Edwards has failed to infect ferrets and mice, the virus, if virus there is, is probably distinct from that of influenza.

FEVER HOSPITALS, PAST AND FUTURE

IN his presidential address to the fever group of the Society of Medical Officers of Health on Nov. 29th, Dr. E. H. R. Harries made good his claim that the modern fever hospital would, in relation to its special purposes, bear comparison with institutions more widely known, even if the attempt to reduce the incidence of endemic infectious disease by the isolation of a minority of infected individuals had failed. The great decline in the enteric group was admittedly due entirely to sanitation; there had been no appreciable reduction in the incidence of scarlet fever, diphtheria, measles, or whooping-cough, and the fall in the mortality of the common specific infections began before the provision of fever hospitals became general. The reduction in mortality of diphtheria Dr. Harries attributed primarily to the introduction of antitoxin, combined with sound nursing; it had now probably reached its limit. Some may not agree with him that the decline in fatality commenced steeply 40 years ago—for during the last decade of the nineteenth century diphtheria mortality was higher than in the preceding two or subsequent three decades—but none will dispute that without skilled nursing, which ordinarily can only be obtained in hospital, antitoxin may be of little avail. Dr. Harries here lends his weight to the belief, now becoming general, that overcrowding in wards is not economical; on the contrary, it results in a high incidence of cross-infections and in a lengthened average stay. The bed spacing which is now the rule would even thirty years ago have seemed fantastically extravagant or divinely fortuitous. All experienced hospital administrators are at one in regarding the ward management of several of the common fevers as essentially the control of infection and reinfection of the upper respiratory tract. To this end not only is adequate bed-spacing in the open ward essential, but also the segregation of patients who constitute potential foci of gross infection. To the pioneers of a generation ago we owe the introduction of aseptic nursing, the cubicle, the chamber, the barrier, and the bed-isolation ward.

Dr. Harries had much to say for the status of the fever hospital as a training and teaching institution. The provision of specialist services, he feels, is not only necessary in the interests of the patient but wholly desirable from the point of view of the institution and the staff. The instruction in fevers included in the medical curriculum is at present quite inadequate; the work of the fever hospital requires the closest integration with that of the children's hospital and the general hospital. The time has arrived for team-work rather than individual effort. Opportunities for clinical study of many of the fevers are strictly limited in this country. Those who have had any extended clinical experience of for instance typhus and relapsing fever (and he might have added small-pox) are now few and the clinical aspect of the enteric group of infections has changed for the better. But there is still much to be learned in the wards of the fever hospital, and opportunities are not lacking for original investigation—something more than, in his caustic phrase, papers that parade the apparatus and protocols of a scientific paper. Dr. Harries would have every assistant medical officer attempt some piece of clinical investigation; and this he can do only by knowing the literature of his special subject and, where the subject lends itself to statistical control, by seeking the advice of those who can foresee possible fallacies. In the proper care of the ear during the acute specific infections Dr. Harries finds the chief prophylactic measure against deafness and deaf-mutism; it would be difficult to assess the value of otologists in fever hospitals either in terms of hearing saved or of stay diminished. The solution of the larger problem of preventing the running ear would ultimately be brought about not by the otologist alone but by his collaboration with medical administrator and clinical officer. In measles the day was not far distant when every case before discharge would be X rayed to detect signs of grave pulmonary sequelæ.

COLLAPSE THERAPY IN PLEUROPNEUMONIA

THE suggestion that therapeutic pneumothorax may be of benefit in pneumonia is not new, for Friedemann treated seven cases by this method in 1921 and was able to report that each had made an uneventful recovery. Experimental support for the method was, however, not forthcoming till Lieberman and Leopold demonstrated its value in the treatment of eighteen dogs suffering from unilateral pneumonia, and compared the result with the fate of a similar number of untreated animals. Before 1934 some fifty cases, with only three deaths, had been reported of the use of the same method in human beings. Already in 1932 Dr. J. J. Coghlan related in our own columns [1] a series of cases of lobar pneumonia treated at St. Olave's Hospital, Rotherhithe, by artificial pneumothorax. The induction gave rise to something very like a normal crisis, but he found that control of the pneumonic process itself was temporary. In our present issue Dr. W. E. Robertson publishes the results obtained in a series of forty-seven cases treated at the Philadelphia General Hospital; the patients included twenty negroes and the death-rate was 43 per cent. The result would not be impressive

[1] THE LANCET, 1932, i., 13, and 1934, i., 1127.

apart from Dr. Robertson's explanation that this hospital serves the needs of the poorest, among whom ignorance, neglect, and economic stress are perennial. More favourable results are reported by Blake, Howard, and Hull [2] who claim four successes in four cases treated within 24 hours of the onset of the disease, and six successes out of nine cases in which treatment was begun between 24 hours and 48 hours after onset. In the three cases apparently uninfluenced by the treatment pleural adhesions were present. It should be remembered, however, that the patient who receives pneumothorax treatment at an early stage is one who has been promptly admitted to hospital. A patient who travels to hospital after the second day of his illness makes a hazardous journey and his chances have often been prejudiced by inadequate nursing before arrival. Those who have employed collapse therapy in pneumonia are agreed that its use in early stages, when pleural pain may amount to agony, brings immediate relief to the patient. A similar relief is experienced when a pleural effusion separates the parietal and visceral pleura in tuberculous inflammations. Even if the treatment effected no more than this much would have been gained. Acute pain and shallow hurried respirations at the onset of pneumonia must lower resistance and prejudice the sufferer's chance of recovery. The immediate relief of pain and respiratory distress may bring the much needed-sleep and enable the physician to dispense with hypnotics. T. Klein and V. L. Tuck, also from experience at the Philadelphia General Hospital, claim [3] that alleviation of pain is invariably followed by a diminution of cyanosis and a slowing of respiratory and pulse-rates. And in our present issue Dr. Cedric Shaw gives striking examples of the relief afforded to pleuritic pain by even a shallow pneumothorax.

When pneumothorax treatment has been adopted the method generally employed has been to inject sufficient air to produce a modest degree of collapse and to maintain this only for a short period, e.g., 300–500 c.cm. at induction followed by a refill some 24 hours later. It has now been suggested [2] that a complete collapse of the diseased lung, or at any rate a complete selective collapse, is necessary to get full benefit from the treatment. This requires X ray control and is only applicable if bedside radiography is available. To obtain adequate collapse without frequent refills and without causing dyspnœa a large initial amount is given, the air being introduced very slowly. In this way as much as 2000 c.cm. of air have been given at induction. As the air flow should not exceed 12 c.cm. or so per minute a period of between two and three hours may be required to raise the intrapleural pressure to atmospheric level. The first refill will be required within eight hours, the time selected for the refill and the number of subsequent refills depending on the pressure level at the end of the first treatment, on the volume of air already introduced, and on the clinical response. For work of this kind a free pleura is, of course, essential and it is difficult to think that the treatment is without risk. There is however reason to believe that as a palliative measure artificial pneumothorax is of definite value in the treatment of pneumonia with pleurisy. That it has curative value is open to question; the successes hitherto claimed may be of the kind commonly noted when a new remedy is introduced. Whether the period of sickness can thus be shortened and the chances of death diminished will only be determined after statistically significant results have been reported and compared with properly selected controls. Meanwhile in preparing a scheme for the treatment of pneumonia the prudent doctor might well add artificial pneumothorax to the list of permitted remedies, with the proviso that it should only be adopted if pleural pain and respiratory distress aggravate incipient disease.

[2] Jour. Amer. Med. Assoc., 1935, cv., 1489.
[3] Amer. Rev. Tuberc., 1935, xxxii., 511.

ON Thursday, Dec. 12th, Dr. Cecil Wall will give the Thomas Vicary lecture to the Royal College of Surgeons of England. He will speak on the Surgeons' Company, 1745–1800.

ON Nov. 26th the gold medal of the Birmingham Civic Society was presented to Sir Gilbert Barling in recognition of his services to the intellectual and æsthetic life of the city. Sir Gilbert was for twenty years prochancellor of the university and has been for ten years chairman of the society.

THE MEDICAL DIRECTORY for 1936 reaches us on Nov. 29th, 1935, and is as convenient and accurate as usual—perhaps a little more accurate, for during the year the Editor of the Directory notified through our columns those members of the medical profession who had not communicated to him their present address, and we were happy to collaborate inasmuch as the accuracy of the Directory is a matter of public importance. The blemishes are likely therefore this year to be more difficult than ever to find. Fortunately the Directory was warned of the general election in time to delete the list of medical Members of Parliament which would otherwise have been somewhat out of date. The numerical summary of the medical profession shows the total names in the 1936 Directory—namely, 58,094—to be an increase of 966 over last year, the increment being far the largest for nine years past. Of this increment, London is responsible for 222, the Provinces for 533, Wales for 32, Scotland for 62, Abroad for 127, and the Services for 3; while Ireland has decreased its entry by 13. We congratulate the Directory on its team-work.

A FUND FOR DENTAL AID

THE Ivory Cross National Dental Aid Fund was established in November, 1914, by the late Miss Fletcher to provide dental aid for soldiers and sailors, to fit them for active service, and for recruits with dental defects which prevented their acceptance. It was not until November, 1915, that the War Office provided for Imperial Service men; nor did the Admiralty undertake the treatment of sailors or recruits for the Navy until January, 1916. Since the war the charity has been actively engaged in the provision of dental treatment for members of the civil population who are unable to meet the cost of such services. The work has grown to such an extent that it was thought desirable to reorganise the administration on a wider basis, and this has now been done. The council includes representatives of many other interested charities and a committee representative of the dental profession is being formed for advisory purposes. Grants in aid of dental treatment are made on the recommendation of a case committee after examination of the claims received from numerous applicants. Although the Ivory Cross is run as far as possible on a contributory basis, it is necessary to make grants to many who are unable to contribute anything, and the strain on the funds is consequently heavy. It is rightly stated that the work which the charity could carry out, had it adequate funds, is enormous. The address is 67, Welbeck-street, London, W.1, and all communications, including applications for assistance, should be addressed to the secretary.

PROGNOSIS

A Series of Signed Articles contributed by invitation

LXXX.
PROGNOSIS OF PITUITARY TUMOURS

I*

THREE varieties of tumour are found in the anterior lobe of the pituitary gland: chromophobe adenoma, acidophil adenoma, and basophil adenoma.[1] The basophil adenoma has recently been considered by Cushing as the cause of certain endocrinal symptoms, but the information so far accumulated is not sufficient to justify prognosis. In acidophil and chromophobe adenomas, on the other hand, the course of the illness can be predicted within certain limits. Both types of tumour produce disturbances of bodily appearance and of the other endocrine glands of the body, and, as they enlarge, both tend to project upwards and press upon the optic chiasm.

Acidophil adenoma is the type of tumour that gives rise to acromegaly. This condition is recognised at a glance by the characteristic changes of external appearance. The diagnosis is easy and the symptoms manifold, and it is not surprising therefore that in acromegaly the prognosis has to cover a wide field. In *chromophobe adenoma*, on the other hand, the question of prognosis arises in a different way. The changes in external appearance produced by this tumour are far from obvious and do not distress or incommode the patient; the diagnosis is practically never made until the onset of visual symptoms and recognition of the fact that these symptoms are due to involvement of the optic chiasm. In these cases, and they are much more common than cases of acromegaly, prognosis will largely centre upon what is likely to happen to the patients' eyesight.

Methods of Treatment

Before considering to what extent these maladies can yield to treatment, it is advisable to survey the therapeutic methods so far available. Because of certain difficulties and dangers surgical attack upon a pituitary adenoma is usually limited to partial removal of the tumour, with the object of relieving pressure upon the optic chiasm. Of the other methods, irradiation by the modern high voltage X ray plant in the hands of experts has proved very useful in some cases of acromegaly, and so, to a lesser extent, has the implantation of radium or radon into the sella turcica by open operation. There is so far no evidence that irradiation is of much value in chromophobe adenoma. These are the only methods of radical treatment at our disposal. Dietetic treatment is of importance in certain phases of pituitary disease, and insulin is helpful in many cases of acromegalic diabetes, but other varieties of hormone treatment, of which many have been tried, have not yet proved successful.

Acromegaly

Acromegaly is compatible with a long and useful life. This is well illustrated by the case of Dr. Leonard Mark, who practised medicine in London with considerable distinction notwithstanding that he was for many years afflicted with a severe degree of acromegaly, described in his book ("Acromegaly: a Personal Experience," London, 1912).

What are the prospects of one who, from coarsening of his features, increased prominence of his mandible and enlargement of his extremities, is recognisable to all beholders as a sufferer from acromegaly? There is nothing so far known that can bring back his normal appearance and it is well, therefore, that he is usually not disturbed by the disfigurement, so gradual is its progress. If the disease begins before the epiphyses are united the patient will grow to gigantic proportions, and the younger he is the more intense the change. But the changes of acromegaly and acromegalic gigantism do not progress indefinitely; usually they cease after a few years, though the lower jaw may slowly project a little more, with increasing disturbance of the bite. Acromegalic patients seem particularly subject to dental caries and need constant attention to their teeth and to their bite. X ray treatment is probably of considerable value in limiting these disturbances and in diminishing the thickening of the subcutaneous tissues that is characteristic of the disease.

There are many patients with pituitary adenoma in whom slight alterations of an acromegalic type can only be found on close scrutiny, and these changes do not progress. They are cases of fugitive acromegaly[2] (Bailey and Cushing, Amer. Jour. Path., 1928, iv., 545) and the adenomas that produce them are usually composed not solely of acidophil cells but of a mixture of acidophil and chromophobe cells. In these cases a cheerful forecast about the change of features can be given if the question arises.

Sexual Dysfunction

Both in acromegalic and in chromophobe adenoma sexual functions tend to be greatly depressed or absolutely lost. Evidence is accumulating to show that this is due to pressure of the tumour upon the basophil cells of the anterior lobe, and W. R. Henderson (Endocrinology, 1931, xv., 111) has shown that it is least likely to occur when the sella is small, the tumour being either entirely suprasellar, or, if intrasellar, quite small.

Of females of the child-bearing period, over 70 per cent. sooner or later cease to menstruate, while others have scanty and irregular periods. Menstrual activity is affected less frequently in acidophil than in chromophobe adenoma. In Henderson's series 16 out of 66 acromegalic women of the child-bearing period continued to menstruate regularly for some time after their acromegaly had become obvious; in a few of them one or even two normal pregnancies occurred. In chromophobe adenoma amenorrhœa is almost invariably the first recognisable symptom of the disease and subsequent child-bearing is the greatest rarity.

After operation, or less commonly after intensive X ray treatment to the pituitary gland, the normal menses will sometimes return and normal pregnancies have occurred. In one of my cases a healthy child was born, although the mother had never menstruated after her tumour was removed eighteen months before the confinement (D. M. Stern, Proc.

* The prognosis of visual loss will be dealt with in a second article.

[1] No attempt is made here to consider epidermoid tumours (tumours of Rathke's pouch) or other tumours arising near the pituitary gland.

[2] O. Hirsch (Wiener klin. Woch., 1931, xliv., 932) has called this *benign acromegaly* to distinguish it from outspoken *malignant acromegaly*.

Roy. Soc. Med., 1934, xxvii. (Sect. Obst. and Gyn.), 79–80). In males sexual disturbance occurs perhaps less frequently than in females, but in practically all subjects with a large tumour there is partial or complete loss of potency and of sexual desire. Sexual function often improves after operation, but it is not possible at present to predict those cases in which improvement will occur.

Disturbance of Carbohydrate Metabolism

Patients with pituitary adenomas are subject to disturbance of carbohydrate metabolism. In chromophobe adenoma sugar tolerance is usually raised and the patient becomes fat. The obesity is rarely of such a degree as to require dieting, but when it is dietetic treatment is usually effective. With few exceptions acromegalics have a lowered sugar tolerance and diabetes occurs sooner or later in 25 per cent. of them. I have also seen it in a case of suprasellar cystic chromophobe adenoma. (Diabetes is also very common in association with basophil adenoma.) It may come on years after the onset of acromegaly, even after the visual symptoms of the disease have been successfully dealt with by operation, and it is never safe to predict that an acromegalic will not develop diabetes. In this connexion it may be said, however, that it is more likely to occur in patients with a family history of diabetes. Its onset appears to bear no relation to the size of the tumour, and it is of variable intensity. As a rule it responds fairly well to dieting and insulin, and is more easily controlled in this way after partial removal of the tumour than before. A few cases have been reported in which diabetes temporarily disappeared after removal of the tumour. All acromegalics should have expert guidance about their diet.

Headache and Other Subjective Discomforts

In acromegaly severe headache behind the eyes is likely to occur as the malady advances. The walls of the bony sella take part in the generalised bony thickening that is a characteristic of the disease and doubtless offer great resistance to increase in bulk of the tumour they enclose. It is not surprising that lacrymation, sometimes intense, usually accompanies the headache, probably produced by expansion of the tumour laterally and by partial obstruction of the cavernous sinuses. Sudden cessation of headaches suggests that the tumour has broken through the diaphragma sellæ and is extending upwards. Pain in the face, often unilateral and perhaps even simulating trigeminal neuralgia, may also occur. These symptoms can be partially relieved by irradiation of the pituitary region, and also by transsphenoidal decompression of the sella. It may be that this operation should sometimes be undertaken for the relief of headache alone.

Acromegalics suffer also from discomfort in their hands and feet. Enlargement of the tongue may make speech difficult and may offer partial obstruction to breathing during sleep. Nasal catarrh also is common in advanced cases and most acromegalics suffer at some time or other from periods of great bodily weakness. These symptoms are not necessarily incapacitating and they are often improved by operation. Usually the discomforts lessen as the years pass.

Patients with chromophobe adenoma do not suffer from intense headache, doubtless for the reason that in them the bony sella is not thickened and expands or gives way as the tumour increases in size. But they often have, as do acromegalics, periods of drowsiness when they feel an intense desire to give way to sleep in the day-time

HUGH CAIRNS, M.B. Adelaide, F.R.C.S. Eng.,
Surgeon to the Neurosurgical Department, London Hospital.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Comdrs. K. A. I. Mackenzie to *Victory* for R.N.B.; S. G. Rainsford to *President* for R.N. College, Greenwich; and A. G. Bee to *Drake* for R.N.B.

Surg. Lt.-Comdrs. L. J. Corbett to *Galatea*; and J. G. Holmes to *Pembroke* for R.N.B.

Surg. Lts. G. D. Wedd to *St. Vincent* and to *Amphion* on commg. for trials; and S. J. Wheeler to *Tamar* for R.N. Hospl., Hong-Kong.

ARMY MEDICAL SERVICES

The King has approved the following appointments:—

Major-Gen. T. S. Coates, O.B.E., late R.A.M.C., Col. J. Heatly-Spencer, O.B.E., late R.A.M.C., and Lieut.-Col. R. N. Chopra, C.I.E., I.M.S., to be Honorary Physicians to the King, in succession to Major-Gen. R. B. Ainsworth, C.B., D.S.O., O.B.E., and Major-Gen. P. H. Henderson, C.B., D.S.O., late R.A.M.C., and Major-Gen. Sir Robert McCarrison, C.I.E., I.M.S., who have retired.

Major-Gen. O. Ievers, D.S.O., late R.A.M.C., Col. E. W. C. Bradfield, C.I.E., O.B.E., Honorary Surgeon to the Viceroy of India, and Lieut.-Col. A. A. C. McNeill, I.M.S., to be Honorary Surgeons to the King, in succession to Major-Gen. J. F. Martin, C.B., C.M.G., C.B.E., late R.A.M.C., and Major-Gen. H. R. Nutt, late I.M.S., and Col. H. E. Stanger-Leathes, late I.M.S., who have retired.

Lieut.-Col. R. N. Chopra and Lieut.-Col. A. A. C. McNeill are promoted to the rank of Brevet Colonel on their appointment as Honorary Physician to the King and Honorary Surgeon to the King, respectively.

ROYAL ARMY MEDICAL CORPS

Short Service Commissions: Lts. (on prob.) restd. to the estabt.: A. M. Pugh, J. H. Taylor, and G. C. Dansey-Browning.

A. R. O. Denton to be Lt. (on prob.).

Lt. (on prob.) G. G. Robertson resigns his commn.

REGULAR ARMY RESERVE OF OFFICERS

Lt.-Cols. C. T. Edmunds, D.S.O., and J. A. Anderson, and Majs. G. H. Stack and E. G. Anthonisz, having attained the age limit of liability to recall, cease to belong to the Res. of Off.

ROYAL AIR FORCE

Wing Comdrs. P. T. Rutherford, O.B.E., to No. 1 Flying Training School, Leuchars, for duty as Medical Officer; and T. J. Thomas to No. 6 Flying Training School, Netheravon, for duty as Medical Officer.

INDIAN MEDICAL SERVICE

Majs. to be Lt.-Cols.: R. A. Logan and F. M. Kirwan.

Maj.-Gen. T. G. F. Paterson, C.B., D.S.O., K.H.P., retires.

Indian Medical Department.—Capts. (Sen. Asst. Surgs.) to be Majs. (Sen. Asst. Surgs.): L. P. Gernon and R. H. Hughes.

DEATHS IN THE SERVICES

The death occurred at Cheltenham on Nov. 27th of Lieut.-Colonel WILLIAM KEITH HATCH, I.M.S., retired, who was born in 1854. He qualified M.B., C.M. Aberd., and M.R.C.S. Eng. in 1876, becoming a Fellow in 1887. After residence at a provincial hospital he went to India in November, 1877, as "Surgeon, Bombay Army." He became surgeon to the Jamsetji Jijibhoy Hospital and first professor of anatomy, then professor of surgery at the Grant Medical College. In 1897, when principal of the college, he reached the rank of Lieut.-Colonel, retiring six years later. Colonel Hatch held the Afghanistan medal 1880, which was issued in that campaign instead of the Indian medal.

SPECIAL ARTICLES

THE PHENOMENON OF TWORT-d'HÉRELLE AND ITS SIGNIFICANCE

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It is just 20 years since Twort wrote the first description [1] of transmissible bacterial lysis. His work, however, published in the middle of the war passed unnoticed, and it was left for d'Hérelle [2] to draw the attention of inquirers to a remarkable phenomenon which has never ceased to enthrall them. Later work has determined the conditions, the processes, and to a certain extent the mechanism, of transmissible autolysis—a widespread phenomenon in the bacterial world. In spite of this its significance remains obscure and agreement is far from reached on the nature of the factors in play.

Singular it is that Twort had from the start foreseen the principal hypotheses which have since been put forward. We need not dwell on the views that it might be a new and lower form of life or that it was an invisible phase of the germ itself. Although revived by certain workers these views have not been accepted. It was otherwise with two explanations submitted by Twort, known as the parasitic and the diastasic theories, which have, with varying fortunes, prevailed in the history of transmissible lysis. Let us consider the arguments for each of these theories and see where they agree with the known facts.

1. The substances obtained from vaccinia pulp (for the staphylococcus, Twort) or from the intestinal contents (for the dysenteric group, d'Hérelle) impress on sensitive bacteria important modifications ending in conditions favourable to complete lysis.

2. The phenomenon is capable of being reproduced indefinitely—i.e., the active principles are regenerated during lysis.

3. The regeneration of the active principle, as well as the lysis, only occurs with living germs.

4. As shown by surface action and the results of dilution (d'Hérelle) the active principles have a discontinuous structure now known to be corpuscular.

5. These principles manifest a true autonomy in regard to the bacteria at the cost of which they develop (Bruynoghe, Wollman). This autonomy holds not only for the antigenic function of the active principles (Bordet and Ciuca) but also for their other characteristics.

THE PARASITIC THEORY

The persistence of certain characteristics, in the course of passage through different kinds of bacteria—e.g., antigenic control and sensibility to trypsin, Wollman and Mme. E. Wollman—suggests the existence of a power of assimilation. This, taken into account with the variability of other characteristics (virulence), leads to the conclusion that the active principles are living substances (d'Hérelle). The facts set out above appear to agree with the theory of a virus. The separate entity of the active principles, their autonomy, and their multiplication in the course of lysis are explained in this theory in the most natural way. This is d'Hérelle's particular theory which he has developed quite logically. The title of his first paper, on an Invisible Organism Antagonistic to the Dysentery Bacillus, is in itself a confession of faith. Since then d'Hérelle has continued to gather facts in support of his theory and many bacteriologists have given their allegiance to it. To d'Hérelle the active agent is an ultra-virus parasitic on bacteria, the *Bacteriophagum intestinale* or *Protobios bacteriophagus*. Lysis is the result of the action on bacteria of ferments secreted by the bacteriophage.

For some time this parasitic theory seemed to furnish a satisfactory explanation of the known facts. There were, indeed, a few difficulties, but these appeared to be on points of secondary importance. Thus the fact that the bacteriophages only multiplied in the presence of living bacteria was in accordance with all that was known about filtrable viruses, but it was remarkable that their multiplication was dependent on that of the bacteria themselves (Bordet, Wollman.) Similarly how was it that bacteria, obligatory parasites, were found in media where sensitive bacteria failed to appear? Spontaneous bacteriophagy furnished a more serious difficulty. From the start Twort had noticed the apparently spontaneous appearance of transmissible lysis in pure cultures, and this fact encouraged him to discard the theory of a virus. d'Hérelle began by contesting the identity of Twort's phenomenon with bacteriophagy; the spontaneous cases of bacteriophagy, properly so-called, the supporters of the virus theory led by d'Hérelle explained by assuming the presence, either latent or occult, of pre-existing bacteriophages. Now the identity of the phenomena of Twort and d'Hérelle is well established, thanks chiefly due to the work of Gratia. On the other hand, it seems difficult to explain the numerous cases of spontaneous bacteriophagy, described by various workers, by a pre-existing contamination.

But the most serious difficulty confronting the parasitic theory is the existence of spontaneously lysogenic cultures. For those who maintain the theory of a virus it is a question of cultures being contaminated, but becoming resistant and living in symbiosis with the bacteriophage. Though not beyond the bounds of possibility such an explanation becomes extremely artificial when applied to all known cases of spontaneously lysogenic cultures. For instance F. M. Burnet, to whom we owe the most complete study of this question, has shown that all cultures of *B. paratyphosus* C, examined from whatever source (India, S. America, or Europe), were lysogenic and the bacteriophages from all these cultures were identical.

J. Bordet, studying a spontaneously lysogenic culture of *B. coli*, proved that there was neither lysis of sensitive germs nor regeneration of the active principle in decalcified medium. Now although the active principle was invariably absent during repeated passages on such a medium it reappeared when the lysogenic culture was transferred to ordinary media. It seems extremely difficult, if not impossible, to reconcile such facts with the theory of a virus. The same is true of observations I have recently made with a spontaneously lysogenic culture of *B. megatherium*.

The study of this spore-forming bacillus has a particular interest. Den Dooren de Jong [3] has shown that cultures from spores which had been heated to 95°–100° C. remained lysogenic. The temperature necessary to destroy the bacteriophage produced by *B. megatherium* being 75° C. it would appear that the formation of bacteriophages de novo in cultures from heated spores and at the same time their endogenous origin was at last definitely established.

But this is not so. For Adant and Cowles have shown that spores of *B. subtilis*, "contaminated" with the corresponding bacteriophage, could be raised to a high temperature (100° C.) without the bacteriophage being destroyed. Similar results were obtained through the action of very high pressures.[4] Neither the action of heat nor of pressure enables us to differentiate between cultures spontaneously lysogenic and those "contaminated" with bacteriophage.

Fortunately an observation of another order made on a lysogenic culture of *B. megatherium* can be brought in to refute the theory of symbiosis with an extrinsic bacteriophage. Whereas cultures on broth of Den Dooren's *megatherium* contain free bacteriophage (titre 10^{-3} 10^{-4}), cultures on gelose do not. Lysis of such a culture by means of a drop of egg white (lysozyme of Fleming) is sufficient to cause the appearance of the bacteriophage; the active principle confined in the bacterial cells grown on gelose has been freed by the action of the lysozyme. It is an interesting fact, established by a number of titrations, that each bacterial element sets free only one bacteriophage corpuscle.[5] Such numerical relationship between bacteria and bacteriophages would be difficult to explain by the theory of symbiosis. These findings, as well as others which cannot be enlarged on here, raise such difficulties for the parasitic theory that most bacteriologists have abandoned it. For instance, in an article devoted to bacteriophages published in July, 1933, Hoder [6] came to the conclusion that "So many facts tell against the view held by d'Hérelle and his school that, without giving preference to any of the numerous theories formulated, it can be said with tolerable certainty that the bacteriophage is not a living being sui generis."

THE DIASTATIC THEORY

But if the active principles of transmissible lysis are not invisible living beings or viruses, what are they? The most striking manifestation of the phenomenon being the lysis of the bacteria attacked, Twort had conceived the idea of a particular ferment which was reformed in the course of its action. In spite of the difficulty of understanding such a process the diastatic theory has gained a favourable reception. Revived under various guises by numerous authors (Kabeshima, Gildemeister, Otto, Doerr, and to a certain extent by Bordet and his collaborators) it was at one time accepted by almost every bacteriologist; agreement was wellnigh universal that bacteriophages were soluble substances, lytic ferments, lysins, or autolysins.

Without stressing all the facts which militate against the identification of bacteriophages with lysins or autolysins—they are the same facts which have led to them being regarded as viruses—let it suffice to point out that these "lytic principles" are in fact devoid of any direct lytic action. Lysis properly so-called, as I have demonstrated,[7] is the work of bacterial autolysins. On the other hand, research on the dimensions of the active elements in transmissible lysis carried out for several years at the institute for the Study of Colloids in Frankfort, as well as at the Medical Research Institute in London, have assigned to these dimensions values on a very different scale from those of molecules of known ferments. From these researches it appears that the dimensions of the active corpuscles are constant for a given bacteriophage and vary for different bacteriophages, the extreme limits being, according to the method used (filtration or centrifugalisation) 8–12mμ and 75mμ (Elford and his fellow workers), or 20mμ and 90mμ (Bechhold and Schlesinger).[8] Summarising the results obtained in his laboratory Bechhold writes:—

> "The dimensions of these corpuscles have been determined by an unexceptionable method and their form has been recognised; the elements themselves have been seen with the ultra-microscope and obtained in a pure state in quantities sufficient to be weighed."

All the fabric of ideas opposed to the parasitic theory, under the name of diastatic theories, is thus found to be baseless. And yet it might seem extraordinary to set up the parasitic theory as the solution of the problem of bacteriophage when we have just seen that Hoder and the majority of bacteriologists have definite grounds for rejecting it. In reality the quantitative data on dimensions of bacteriophages, as Bechhold has shown, permit us to discard the diastatic theory (taking the common acceptation of the word diastase), without authorising us at the same time to conclude that bacteriophage is a virus. Neither the corpuscular form of the active principles nor their dimensions prove anything in this respect. Only proof of their exogenous origin would be crucial and that proof is entirely lacking. Spontaneous bacteriophagy and especially lysogenic cultures make exogenous origin at least highly improbable.

THEORY OF HEREDITARY FACTORS

We are thus led to reject the parasitic and diastatic theories, for they are irreconcilable with the interpretation of the facts; on the one hand the corpuscular elements behaving in every way like living things, on the other the bacterial endogenous origin of these elements. Now these facts, impossible to reconcile with the classical theories, seem to find a simple explanation in the theory of hereditary factors which I have repeatedly enunciated.[9] According to this theory the active principles of bacteriophages are particularly stable elements of cellular origin and act as a material basis for certain hereditary characters—hereditary factors in the Mendelian sense. This theory not only accounts for the facts which turn the scale now towards the virus theory, now towards the diastatic theory, but permits us to grasp facts which remain unexplained in either of these theories. The regeneration of bacteriophages is a function of the multiplication of the bacteria themselves, why there is a simple numerical relation between active corpuscles and lysogenic bacteria, why bacteriophages do not work on dead or quiescent germs. The terms bacteriophage and bacteriophagy, justified by the parasitic theory and by usage, then lose their significance and should be replaced respectively by lysogenic factors (Wollman) and transmissible autolysis (Bordet) or perhaps hereditary contagious autolysis (Wollman). I have shown that other processes of an infectious nature may have an analogous explanation, notably filtrable tumours and certain diseases of plants called mosaics.

Whatever may be the further extensions of this conception I have endeavoured here to show the new avenues which have been opened up by the study of the phenomenon of Twort-d'Hérelle. When the terms "infectious" and "microbial" became by degrees synonymous, the researches arising from the discoveries of Twort and of d'Hérelle have revealed the existence of infectious processes of non-microbial nature. In these processes certain characters (having a pathological form in the examples under discussion but not necessarily always pathological) are linked to a stable material basis and

in consequence can exist in an extracellular medium. Owing to this peculiarity these characters can be transmitted not only from mother-cell to daughter-cell (ordinary heredity) but also, through an external medium, from affected cell to normal cell (para-heredity).

The idea of a material basis for characters, which under the name of the theory of genes has proved so fertile in the study of normal and pathological heredity in the higher organisms, thus seems capable of extension to certain processes of an infectious nature which up to the present were usually attributed to genuine viruses.

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A MODIFIED PLAN FOR A GENERAL HOSPITAL

CHANGES SUGGESTED AT THE NEW WESTMINSTER HOSPITAL

BY E. ROCK CARLING, F.R.C.S. Eng.

SURGEON TO THE HOSPITAL

THE lay-out of a hospital in this country usually involves a horizontal division between visiting and resident patients. Although, generally speaking, each resident case has been an ambulatory, and will be so again on discharge, there is a gulf fixed between "in" and "out" which is symbolised by a separate entrance and emphasised by a change of doctor-in-charge. One consequence of this is that the "junior" staff, who may retain that status for twenty years, have care of patients only so long as they are fit to attend for treatment, and, with but minor exceptions—for the beds allotted to them in the smaller hospitals are usually comparatively few—lose sight of those patients as soon as their condition necessitates entrance to a ward.

No doubt the burden of out-patient work tells hardly upon senior men whose reputations have brought them big practice and many calls on their time for public duties. No doubt too the "clinic" exclusively in the wards is a convenient milieu for teaching and research, but it seems illogical from the point of view of service to the patient-community that there should be a break in the personnel. There seems, in fact, little reason nowadays for the continuance of this system other than the structural plan of hospital buildings. If the division of the hospital be made vertical rather than horizontal, complete effectiveness of the "firms" that have grown up as the unit of service in the hospital would be a natural and reasonable result. This, at any rate, is the idea behind the plan now under consideration for the new Westminster Hospital.

ADVANTAGES TO THE STAFF

There was a time when the distinction between the out-patient physician or surgeon and his senior was a very definite one. There was a time when the relations between members of a staff were those of jealousy and distance, and when harmonious coöperation was often impossible. Such a state of affairs is now certainly rare, and the rule is that men work generously together, and if the work of a firm is concentrated there will at least be every opportunity for delegation, for sharing, and for mutual assistance, that must redound to the advantage of the patients.

On a surgical floor there will be two full units, and certain accessory beds. Each firm will have an out-patient consulting-room and a theatre, but these will be paired so that a firm will be able, on its duty days, to make use of the consulting-room and theatre of his collateral unit, unless urgent work by the other firm interfere. The out-patient rooms, though on the same floor and adjacent to the wards, will be reached by a separate part of an encircling corridor.

The patients from the first moment of their arrival will be allotted to a firm or unit and will continue under the care of the senior or junior honorary medical officer, the same sister, registrar, and house officer to the last day of their attendance; and so again, if they have other need of the hospital, always finding someone who knows them and their past, ready to remember and welcome them. The same sister who has had charge of them in the ward will have charge of them as an out-patient on discharge and follow-up. The same sister who has charge of the male patients of a firm will have charge of the female. The permanent personnel of each firm will cover all its patients. The physicians, who make less use than the surgeons of their out-patient consulting-rooms on days other than those of their official visits, do not desire a separate out-patient department for each firm, and theirs will be common to the whole general medical department but will be in such proximity to their wards that the nursing may be directed by the sister of each firm at the appropriate time.

The specialists, at any rate the ophthalmic, oto-rhinological, dental, and dermatological, regard their clinics as essentially ambulatory, with beds attached rather than as wards in charge of a senior fed from an out-patient department in charge of his junior.

At the present time the actual attendances—apart from unofficial visits which nowadays are many—of the senior and his junior are at least seven a week between them, and if these be appropriately spaced, since availability of rooms and theatres is unrestricted, a fuller and more complete service to the patients will result without adding to the work of the honorary staff.

ADVANTAGES TO THE PATIENT

One consequence of this fuller or less intermittent service by the honorary staff will be to facilitate a solution of the problem of out-patient waiting. There will, of course, be a "front-surgery" on the ground floor, and adjacent to this what might be called a casualty clearing station in charge of whole-time officers of the status of registrars. Besides being at hand to superintend and advise the house officers in the "surgery," their job will be to sort newcomers for their appropriate units, and to select the "teaching" cases of the day, and with an out-patient clientele such as that found at Westminster it will be possible to arrange appointment times for a great many cases. To work such appointment bookings smoothly there will be an almoner on each floor, in whose care all the patients of two units will find themselves. The limitation of her

work to those units will, it is believed, also permit closer relations with the general practitioners by simplifying inquiry and communication.

The continuity of nursing service that will follow upon bringing the out-patient department into close contact with the ward should benefit the patient substantially, and there are, moreover, advantages in having a nurse's training supervised in both departments by one sister. It is unlikely that the scheme will necessitate any increase of nursing staff.

It might seem at first sight that to have separate out-patient departments must involve increased capital expenditure and more expensive upkeep; but the more the details of structure are studied the less serious does this point become. The waiting space though scattered is no larger. The rooms of those specialists who require increasingly complicated apparatus are, in any case, unsuitable for use by other departments, even when unoccupied by those specialists. The out-patient rooms of the gynæcologist and obstetricians, now that there are ante- and post-natal clinics, children's welfare, and other special clinics in addition to the regular out-patient days, are pretty continuously occupied. The rooms of the surgical firms will certainly be frequently, if not always, in use, for there are many patients who attend after discharge for periodic injections, or for plasters, for dressings, and so on.

The lift service will be an additional expense, but it seems likely that economies will be effected in other directions, and if the service rendered be more efficient, the saving of time itself will be saving of money.

THE PROBLEM OF CANCER

RETROSPECT AND PROSPECT

AT the beginning of October Dr. W. E. Gye succeeded Dr. J. A. Murray, F.R.S., as director of the Imperial Cancer Research Fund. His contribution to the thirty-third annual report, presented last Wednesday, is a survey of the changes in outlook on cancer since 1902 when the Fund was established. This survey is of more than ordinary interest to the general medical reader, and we make no apology for reproducing much of it in Dr. Gye's words.*

"A DISEASE OF CIVILISED MAN"

In 1902, he says, extreme confusion and pessimism on the subject prevailed in the medical profession. There was a firm belief, amounting to a dogma, that cancer was a disease limited to man and that it occurred only in civilised communities, where it was increasing at a terrifying rate. Cancer families, cancer houses, and cancer villages were believed to exist. The causative influence of geological formation, of soil, of climate, of diet, of dwelling near trees or near rivers, was discussed. Many clinicians believed cancer to be an infectious and even a contagious disease. "Cancer germs" were isolated, or demonstrated in malignant cells by special staining methods. The destruction of bedclothes and other materials which had come in contact with cancer patients was often demanded.

The morbid anatomists, however, who had done fundamental work in classifying the numerous and different types of malignant new growths and who found it difficult to reconcile the morphological appearances of a cancerous growth with those of known processes of infection, regarded cancer as a cellular disease and propounded a number of hypotheses to explain its origin, of which only one—the Cohnheim theory of embryonic rests—has survived as a possible explanation for certain rare malignant conditions. The question whether the growth of a malignant tumour is brought about by transforming the surrounding normal tissues into cancerous tissues or whether solely by multiplication of cells already malignant was a matter for discussion and controversy. Even the fact that cancer can be cured by operation at an early stage was by no means generally accepted.

An argument advanced to support the dictum that cancer is a disease of civilisation was the alleged freedom from the disease of lower animals. It is true that veterinary surgeons had described its occurrence in dogs and horses, but the evidence was either ignored or was met by the assertion that the features of the disease did not correspond with those in man, or, alternatively, that contact with man was responsible. It is difficult now to recreate in imagination the atmosphere of uncertainty which led to such an attitude. But it must be remembered that thirty years ago bacteriology had progressed far in its triumphant career, and that many diseases had been found to be transmissible to animals by inoculating into them morbid material from human patients. Attempts had frequently been made to transmit cancer from man to various species of animals, but always without success; and it was therefore concluded by analogy that animals are resistant to cancer. Hanau's observation that a rat tumour can be transmitted to other rats by inoculating pieces of the living tissue was ignored, and Morau's confirmation of it was no more favourably received. Even Jensen's subsequent demonstration that inoculated cancer arises from the actual cells which have been introduced and not through infection of the cells of the new host might have been unrecognised if it had not opportunely coincided with the establishment of the Imperial Cancer Research Fund, which under Dr. E. F. Bashford's direction was undertaking a systematic study of the incidence of cancer in human beings and animals. This study soon showed that the disease could be found throughout the vertebrate kingdom, wherever it was looked for properly. The fact that in all vertebrates animal cells can undergo the malignant transformation and that the resultant malignant cells possess everywhere the same fundamental properties is the foundation on which the experimental investigation of cancer, as it exists to-day, is built. Of the diseases which can be produced experimentally few, if any, simulate the normal human disease so closely as cancer.

This investigation emphasised the essential unity of the phenomenon of malignancy. It indicated that the process which takes place when a normal cell becomes malignant is essentially the same in whatever species or whatever organ it occurs. From another point of view, however, it was possible, and indeed necessary, to regard cancer as a multiplicity of diseases. Cancer is a disease which may appear in almost any organ or tissue. While in animals there were found to be certain sites of predilection in which cancer occurred with exceptional frequency and which were different in the various species, even in closely related species, of animals, in man cancer is found more evenly distributed over the various organs or tissues. In man this organ incidence shows considerable variation in the two sexes and also in different peoples and races. Here, therefore,

* The complete report is obtainable from the offices of the Fund, 8, Queen-square, London, W.C.1.

the further question arises: "Why does cancer arise in this or that particular organ?"

The investigation of ætiological problems of cancer in man is based mainly on statistical data. The opinion, formerly prevailing, that its incidence was rapidly increasing was based on the crude figures representing the total mortality of cancer. Following an argument previously developed by King and Newsholme, Bashford analysed the cancer mortality statistics with reference to the different organs, considering separately the accessible sites in which diagnosis was easy and the inaccessible sites in which diagnosis was difficult. He also induced the Registrar-General to publish the figures in a table classified according to Sex, Age, and Parts Affected, and it proved possible to show that the recorded increase in cancer mortality fell largely though not entirely on inaccessible sites where it is diagnosed with increasing ease. These statistical inquiries demonstrated that cancer is *not* increasing at an alarming rate in civilised communities, or appearing (as was asserted) at earlier ages. Similarly it was shown in other investigations that the disease is found among savages as well as among civilised peoples, and in animals both wild and domesticated, carnivorous and herbivorous.

THE NATURE OF MALIGNANT CHANGE

Side by side with the general and comparative study of the disease a close examination of the phenomenon of transplantation was made by Bashford and Murray. It was found, as Jensen had already shown, that when a fragment of cancer tissue is grafted the tumour which forms is derived from the living malignant cells inoculated; there is clear evidence, at least with carcinomas, that the normal tissues of the host are not "infected"—i.e., made malignant by the inoculum. Also, it was confirmed that transplantation is successful only within the species from which the tumour is derived. A mouse tumour will not grow in a rabbit, for example, or vice versa. The failure to transmit human cancers to the lower animals now became comprehensible. It was shown, further, that the propagation of a mouse cancer in mice can be carried on indefinitely; the malignant cells live and multiply in an unlimited number of generations of normal mice.

Clear deductions may be drawn from this experience, which are important in several respects, theoretical and practical. It follows in the first place that the *primum movens* of the disease is in the cancer cell itself; among other points it is clear that successive generations of normal mice are unable to affect the malignant qualities of the transplanted cells. The practical importance of these observations lies in the fact that most "cancer cures" are based on an assumption that tumours arise and grow because of some constitutional defect in the body of the patient. It has been assumed, for example, that cancers progress because some glandular structure—such as the pituitary or the parathyroid—is discharging inadequately a function which it is supposed to possess, of controlling "growth." There is almost always a confusion in the terms employed in the statement of the theory, but the practice is uniform—the preparation of extracts of the normal gland taken from a large animal and the injection of the extracts into patients in the hope of bringing about a cure. Such treatment is unsound in theory and valueless in practice.

The demonstration by experiment of the local origin of tumours, and the proof that the disease is confined to the affected cells and is not spread by contact and infection within the body, confirmed the conclusions reached by the morbid anatomists during the later decades of the nineteenth century and justified the operative practices of the best surgeons, who aimed at the complete removal of a tumour as early as possible. These results of experimental cancer research consolidated what had hitherto been a tentative, unstable theory; it gave a true theory of the nature of cancer which had a direct effect on surgical procedures.

But if practical medicine derived much benefit from the early results of experimental study, their effect on the theoretical conception of intracellular change was not perhaps so happy. The absence of all microscopical evidence of infection in cancers; the proof that tumours grow out of their own resources, the malignant cell using the body foodstuffs to grow and divide and form the tumour; the fact that tumours of mice could not be propagated by any means except the grafting of living cells; the species specifity of tumours—all these facts, and many others less definite, led investigators to an unshakable conclusion that the explanation of malignancy lies in some alteration in the cell itself, in virtue of which the malignant proliferation is an automatic process, independent of the presence of a continuously acting provocative agent. It is in this sense that tumours are sometimes said to be "causeless." In Ewing's words "the secret of malignancy seems still to remain enshrouded in the obscurities of intracellular life, where it will probably long remain." Nevertheless when *all* the facts which have been accumulated are taken into consideration we have no need to believe that the theoretical problems of cancer are insoluble.

It is an encouragement that since the Great War interest in cancer research has widened. It is no longer confined to the microscopic study of the cancerised cell and of its relationships to normal cells in the body. The attack has been extended to the very onset of the disease. In 1902 Bashford drew up a "draft scheme for inquiry into the nature, cause, prevention, and treatment of cancer" (published in 1908 as an appendix to the Fund's third scientific report) in which the possibility of producing cancer experimentally is discussed in connexion with "sweeps' cancer" and "petroleum cancer." He suggested that "a systematic study of the effects of persistent irritation of different epithelial surfaces in different species of animals might be found to have important bearings." To the Japanese investigators Yamagiwa and Itchikawa belongs the honour of demonstrating, in 1915, that cancer can be produced in this way by painting an animal with tar. This has proved the starting-point of innumerable investigations which have culminated in the preparation by Prof. Kennaway and his collaborators of pure chemical substances with carcinogenic properties. Some of these substances are related chemically to the sterols which are normal constituents of the body. The importance of these investigations is too evident to need any comment.

THE PROBLEM TO-DAY

It is now quite clear that two aspects of the cancer problem must be sharply defined: first that which deals with the conversion of a normal cell into a malignant cell (by tar, pure chemical compounds, parasitic worms, radiant heat, X rays, &c.); and, secondly, that which deals with the properties of the malignant cell itself, seeking an explanation of its power to proliferate indefinitely.

In 1911 Peyton Rous of the Rockefeller Institute, New York, described a spindle-celled sarcoma of the domestic fowl which could be propagated not only with grafts of living cells but also by means of cell-free filtrates, and since then a score or more of filtrable avian tumours of diverse structure have been described. Each has the same remarkable property of filtrability, and the agents possess the same extreme specificity shown by the filtrates of the tumour first described by Rous. There now exists, therefore, a group of tumours caused by intracellular agents which have properties indistinguishable from the viruses.

The first reaction of pathologists to these filtrable tumours was a denial of their neoplastic nature, or, alternatively, an assertion that if they are neoplastic then these tumours are a disease of birds sui genesis imitating cancers of mammals, but not of the same essential nature. But Rous and his collaborators demonstrated conclusively that if these tumours are not true new growths then the task of describing the characters of new growths must be begun again; for these growths of fowls exhibit all the properties which are accepted by competent students as characteristic of true tumours. Briefly, it may be said that apart from the property of non-cellular transmission there is no clinical, morphological, or biological difference between avian and mammalian tumours. Even this criterion of filtrability cannot be claimed as absolute. There are malignant fowl tumours, such as the spindle-celled sarcoma first described by Rous, which though as a rule easily filtrable, may pass into a state in which they do not yield active filtrates. The tumours occasionally lose growth energy and become comparatively benign; when in this state it is frequently impossible to transmit the growths by any means except by grafts of living tissue. Moreover, the recent discovery of a filtrable papilloma of the cotton-tail rabbit by Dr. R. E. Shope has broken the apparently absolute difference in respect of filtrability between tumours of mammals and tumours of birds. One of the pressing tasks of cancer research is the study of tumours of a greater variety of species of animals.

The two aspects of the problem, to which reference has been made, have lately been drawn together by experiments carried out by Prof. McIntosh at the Middlesex Hospital. Tumours were started in fowls by injecting tar subcutaneously, and the tumours thus obtained were transplanted into normal fowls. It was found for three of such tumours that it was possible, once the difficulties of propagation had been overcome, to transmit the growths by means of cell-free filtrates. If these experiments can be confirmed, the part played by tar in cancer causation is different in kind from the part played by the agent which passes through a filter candle and which can be obtained again and again from each successive generation of tumour.

Dr. Gye concludes: "This account of the systematic investigation of cancer which began in an atmosphere of ignorance and pessimism thirty odd years ago, and which has since developed into an independent discipline of medical research that is being carried on vigorously in every civilised country, is necessarily brief and incomplete. . . . But it can be said without fear of contradiction that the knowledge of the disease gained in this short time is more extensive than that of most other chronic diseases and has profoundly influenced its diagnosis and treatment. Cancer has ceased to be an unaccountable mystery, and we need no longer fear that its solution surpasses the wit of man."

MEDICINE AND THE LAW

Unregistered Practitioner Fined for Treatment of Venereal Disease

FOR good and sufficient reasons Parliament in 1917 prohibited the treatment of venereal disease by any person other than a registered practitioner. For infringing this statutory restriction Mr. Robert Vivian Storer was fined £100 with 20 guineas costs at Marlborough-street police-court last week. The summonses alleged that he, not being a duly qualified medical practitioner, did treat two patients for reward, that he prescribed a remedy, and by advertisement offered to treat patients for venereal disease. Mr. Lawson Walton, appearing for the Director of Public Prosecutions, explained that in May last, Mr. Storer, who had practised for many years and held the degrees of M.R.C.S. Eng. and L.R.C.P. Lond., was found guilty after inquiry by the General Medical Council of infamous conduct in having advertised a clinic at his registered address; his name had then been erased from the Medical Register. In the following July an advertisement appeared in a daily paper of the Cavendish Institute of Medical Research, 9A, Cavendish-square; it was described as a diagnostic clinic for venereal and allied infections, including determination of cure and tests of latency. Two men, who answered the advertisement, gave evidence for the prosecution last week. One called by appointment and saw Mr. Storer in a room fitted up as a dispensary. He was examined and was told he was suffering from the disease and could be cured in three months; the fee would be 100 guineas. The patient said this was more than he could afford; Mr. Storer replied that the only alternative was to go to a public clinic for nothing where the treatment would take 12 months and be very unsatisfactory. Asked about a reduced fee, Mr. Storer said he did not make a practice of reducing fees; he was full up with work, and he produced his appointment book to prove the fact. Finally he agreed to accept 40 guineas—25 guineas down and 30s. a week during treatment; but he said the treatment would be less satisfactory and would take longer. Finding the patient undecided, he offered him a treatment on the spot for 3 guineas. The patient had not the money, and was told he must send a cheque immediately. Thinking the whole matter very unprofessional, the patient left the house. In the case of the second witness, Mr. Storer was said to have expressed surprise, after showing the result of the test, that another doctor had passed the patient as free. Mr. Storer offered to cure him for 100 guineas; when the patient was shocked at the amount of the fee, he agreed to accept 25 guineas in advance and 25 for each month of treatment; his consultation fee, he said, was 5 guineas, and this, with the 25 guineas payment in advance, was paid by the patient by cheque. The patient took several treatments but afterwards got other advice and went no more to the clinic. The defence set up by Mr. Storer as regards this second patient was that the man never suffered from venereal disease, and therefore he himself could not be charged with having treated him for it. The magistrate observed that the question whether the patient did in fact suffer from the disease or not did not in his opinion arise.

Mr. Storer, giving evidence on his own behalf, said he founded the Cavendish Institute of Medical Research. He was still a qualified man and a physician and surgeon. He came from Australia at the

age of 21 to qualify as a doctor. He also took a 2½ years' post-graduate course in Vienna and London in the study of venereal disease. He then went back and practised as a specialist in Australia. He had attended medical congresses and had been associated with research as to venereal disease; he had published a book called "Sex and Disease" which had been favourably received by almost every medical journal; his research work had cost him £20,000. He had discovered that other symptoms followed the disease itself. In January, 1934, he came to London and published advertisements of the Cavendish Institute in the medical papers as a free diagnostic clinic. In December, 1934, he called at the office of the General Medical Council with a contemplated partner to ascertain if these advertisements would form any ground of complaint professionally. He never received any ruling from the G.M.C. and, having withdrawn the advertisements for two months, he afterwards reinserted them. In May last he was summoned before the G.M.C. and, thinking he was at last to receive the ruling for which he had asked, he made no defence. His name was struck off the Register; he then amended his advertisements, realising that, as regards venereal disease, his services could only be available as a diagnostician. He said that, since he had been struck off the Register, he had not treated a case of venereal disease, and indeed had sent many such cases to the doctors and staffs of public clinics in London.

Mr. Eustace Fulton argued on the defendant's behalf that diagnosis and treatment were not the same thing. The magistrate thought that, for the purpose of the statute, diagnosis was undoubtedly part of treatment. He held that the case was proved, and he accepted the evidence of the two patients in preference to that of Mr. Storer. It had been said that the defendant was a man of great skill and distinction; in the magistrate's view this statement could have no bearing on the case; it was no answer for the defendant to say "although I am technically disqualified because of advertising, I am a very fine doctor in this particular branch of doctoring." The defence intimated that there would be an appeal on the point of law—presumably as to diagnosis forming no part of treatment. On the facts accepted by the magistrate, however, treatment under Section 1 of the Act and the advertisement under Section 2 of an offer of treatment would seem to have been proved. If a man can be struck off the Register for professional misconduct and can then defy the 1917 Act by resuming practice in the treatment of venereal disease for 100-guinea fees, it is not surprising that the court should think fit to impose a substantial fine.

A Vegetarian's Diet

In the county court at Weston-super-Mare a vegetarian successfully disputed a claim from a lodging-house keeper. He had booked his rooms for a fortnight, stipulating that he and his family were vegetarians and must have vegetarian diet. He vacated the rooms after a week because the plaintiff had not given him reasonable service. The house had been overcrowded, other lodgers sleeping in the breakfast-room and in the bathroom; and the diet had been unsatisfactory, the salad being drowned in vinegar, and the potatoes hard and inedible. The judge held that, in respect both of the overcrowding and of the diet, the plaintiff had failed to give reasonable service. The defendant had therefore been justified in refusing to stay for the second week. The keeper of a lodging-house may not be obliged to cater for everyone who insists on a special diet; if he undertakes to supply a vegetarian diet, he must reasonably keep his word.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

FATS IN THE BLOOD

Mr. C. P. Stewart, Ph.D., in a paper read to the Edinburgh Pathological Club last week, summarised investigations he has been making into the fat content of blood. Estimation of the various constituents of normal human blood (including glycerol by a newly devised method) indicates that as much as 20 per cent. of the total fatty acid found may be present in the form of simple glycerides. In the blood of diabetics the simple glycerides are generally increased, and this increase is the main factor in the very high total fat content often encountered. In pernicious anæmia the quantity of lipoid phosphorus of the whole blood is generally reduced; but Mr. Stewart believes this reduction to be without significance, for he has found that the blood plasma and the corpuscles both contain a normal concentration of lipoid phosphorus. The apparent anomaly is explained simply by the lack of red cells in this condition, for the concentration of lipoid phosphorus is twice as great in the cells as in the plasma.

EDINBURGH ROYAL INFIRMARY

Difficulties facing the Royal Infirmary were referred to at a meeting of the league of subscribers in Edinburgh last week. The sum of £150,000 is still required to complete the extension scheme, and the infirmary's adoption of the management of the new maternity hospital will add greatly to the annual expenditure. Members of the league of subscribers contribute a small sum weekly, but are not entitled to any special consideration in view of this, and some of them have had to be transferred to municipal hospitals for treatment because of the length of the waiting-list of the Royal Infirmary. In view of their regular contributions resentment was expressed that these people should have to pay for treatment at the municipal hospitals, and further have to submit to a means test in order that the amount they should pay might be determined. This was one of the arguments used in a plea for closer coöperation between the voluntary and the municipal hospitals.

IRELAND

(FROM OUR OWN CORRESPONDENT)

FUNDS FOR MEDICAL RESEARCH

For the past two or three years a joint committee, set up on the initiative of the Royal Academy of Medicine in Ireland, and consisting of representatives of the several licensing bodies and of the Associated Hospitals Committee which promotes the sweepstakes and of the Academy itself, has been working at the formulation of a scheme for medical research in the hope of inducing the Minister for Local Government and Public Health to provide adequate funds from the monies at his disposal from the hospital sweepstakes. It was proposed to establish a research council consisting of representatives of the licensing bodies, the Academy, and the hospitals, and the Government, and the Minister

was asked to provide funds to the amount of £10,000 or £12,000 a year, the distribution to be in the hands of the council. The Hospitals Commission, the body appointed to advise the Minister as to the distribution of the sweepstakes funds, recommended the proposal to the Minister some thirteen months ago, and the long delay in the Minister's department has given rise to comment. It is now officially announced, however, that the Minister has approved of the formation of a council of nine, comprising one representative from each of the following, with an independent chairman: the senate of the National University of Ireland; Trinity College, Dublin; University College, Dublin; University College, Cork; University College, Galway; the Royal College of Physicians of Ireland; the Royal College of Surgeons in Ireland; the Royal Academy of Medicine in Ireland. To enable the project to be initiated, the Minister is willing to allocate a sum of a maximum amount of £10,000 for the first year's working. It is understood that the council will meet to take steps to become incorporated, and will consider and formulate proposals for the prosecution of medical research. The Minister has the appointment of a chairman under consideration.

It is not as yet clear how far the proposals approved by the Minister differ from the scheme put forward by the joint committee and recommended by the Hospitals Commission. Some changes which may cause disquietude have been made in the constitution of the council, the body approved by the Minister being smaller and less representative than that recommended to him. More important, however, than the constitution of the council will be its powers, with regard to which the official statement is vague. If its powers are to be limited to "considering and formulating proposals for the prosecution of medical research" and decisions are to rest with some other authority, much disappointment will be felt. It was an essential part of the joint committee's scheme that decisions as to the research to be carried out and the distribution of such funds as the Minister might provide should be in the hands of the Research Council.

BUDAPEST

(FROM OUR OWN CORRESPONDENT)

TERCENTENARY OF BUDAPEST UNIVERSITY

THE University of Budapest was founded in 1635 by Peter Pázmány, Roman Catholic archbishop of Esztergom, and delegates from 130 universities from all parts of the world attended the anniversary of its foundation recently celebrated here with great magnificence. At the time of the Turkish invasion the older universities at Pecs, Pozony, Bratislava, and Buda were destroyed, and in his inaugural address Géza Kornis, rector magnificus, paid tribute to the love of culture which had led Hungary to found this university at one of the most troublous times of her history. He also emphasised the important part Hungary had played in preserving Western civilisation from the invaders; "Hungary stopped the influx of Tartars and Turks," he said; "and if the Magyars had not fought this battle, to-day the Koran would be taught at Oxford." He also spoke of the famous men who had worked at the University and in the medical faculty mentioned particularly János Balas and Ignaz Semmelweis.

An exhibition was held in the library which illustrated the development of the University in photographs, and included many interesting documents relating to its foundation. Among official records the original matriculation books from 1635 were on view.

A prominent feature of the ceremonies was the constitution of the Society of Doctors Sub-Auspiciis Regis. The membership of this society is limited to the very small number of graduates who have passed every examination in their university career with distinction. To such graduates from 1895 onwards Francis-Joseph, as King of Hungary, presented a valuable gold ring. After the end of the late war no awards were made, but in 1923 Nicholas Horthy, as Regent, gave leave for their continuation, granting an iron ring with the inscription "sub-auspiciis gubernatoris." During the 40 years since the award was started it has been given to 147 candidates, and the aims of the new society are to unite its members in reverence and love of their alma mater, to contribute to its maintenance and development, and to assist the university students. Dr. Tibor Verebélyi, professor of operative clinical surgery, received the ring in 1900 and his son of the same name gains it this year; while Prof. Nékám, president of the recent international congress of dermatology, has two sons who have received the honour, in 1928 and 1934.

In connexion with the celebrations the foundation-stone of the University tuberculosis clinic was laid by Bálint Homan, minister of culture. Other stones were laid by the dean and the rector of the University.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED NOV. 23RD, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2860; diphtheria, 1434; enteric fever, 27; acute pneumonia (primary or influenzal), 845; puerperal fever, 36; puerperal pyrexia, 124; cerebro-spinal fever, 13; acute poliomyelitis, 10; acute polio-encephalitis, 2; encephalitis lethargica, 10; dysentery, 29; ophthalmia neonatorum, 65. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Nov. 29th was 3305, which included: Scarlet fever, 1198; diphtheria, 1262; measles, 85; whooping-cough, 240; puerperal fever, 19 mothers (plus 10 babies); encephalitis lethargica, 281; poliomyelitis, 8. At St. Margaret's Hospital there were 14 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox or enteric fever, 28 (0) from measles, 6 (0) from scarlet fever, 9 (2) from whooping-cough, 32 (6) from diphtheria, 48 (16) from diarrhœa and enteritis under two years, and 53 (12) from influenza. The figures in parentheses are those for London itself.

Manchester reported 12 deaths from measles, Liverpool 4, Bolton and St. Helens each 2, no other great town more than 1. Deaths from diphtheria were reported from 20 great towns: 4 from Sheffield, 3 each from Birmingham and West Bromwich. The mortality from influenza is scattered over 21 great towns, Manchester, Newcastle-on-Tyne, and Sheffield each reporting 3, no other great town more than 2. There were 4 deaths from whooping-cough at Liverpool.

The number of stillbirths notified during the week was 269 (corresponding to a rate of 44 per 1000 total births), including 36 in London.

VOLUNTARY HOSPITALS OF YORKSHIRE.—The Yorkshire Voluntary Hospitals' committee in their thirteenth annual report record that grants to hospitals amounting to £2611 and £7445 in other contributions have been paid direct to hospitals.

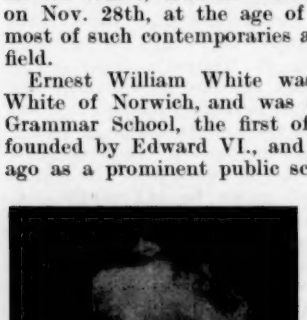
OBITUARY

ERNEST WILLIAM WHITE, C.B.E., M.B. Lond.

EMERITUS PROFESSOR OF PSYCHOLOGICAL MEDICINE, KING'S COLLEGE, LONDON

THE veteran specialist in mental disease, Prof. E. W. White, died at Betley House, Shrewsbury, on Nov. 28th, at the age of 84. He had outlived most of such contemporaries as worked in his special field.

Ernest William White was the son of Richard White of Norwich, and was educated at the Bury Grammar School, the first of the grammar schools founded by Edward VI., and ranking seventy years ago as a prominent public school. He received his medical training at King's College Hospital and the Norfolk and Norwich Hospital and at King's was a highly distinguished student, winning several scholarships and medals, among others the Warneford clinical scholarship. He qualified in 1872 as M.R.C.S. Eng., and proceeded to the London degree, where at the first M.B. examination he secured the gold medal in anatomy as well as taking honours in all the other subjects. After house appointments and a prosectorship of anatomy at the Royal College of Surgeons of England, he commenced his successful career in psychiatric medicine with an appointment as assistant medical officer to the Kent County Asylum, Chartham. This post he held for nine years, when he became resident physician-superintendent at the City of London Asylum at Dartford, and held this appointment for eight years. During this time he successfully completed his M.B. course, obtaining the M.B. Lond. in 1883, graduating in the first division, and in the following year obtained the diploma of M.R.C.P. Lond. In 1890, in succession to Prof. Edgar Sheppard, he became professor of psychological medicine at King's College, a post which he held for 20 years, when he was elected emeritus professor.



ERNEST WHITE
[Photograph by Elliot & Fry

Prof. White had been an enthusiastic volunteer and acting surgeon in connexion with the Royal West Kent Regiment. Shortly after the outbreak of the European war he was appointed consultant in mental diseases to the Western Command, and later consultant to the War Office with the rank of lieutenant-colonel. He was appointed O.B.E. in 1919, and in 1920 obtained the C.B.E. (mil.).

Prof. White, who had been president of the Royal Medico-Psychological Association, made many practical contributions to the literature of his subject. To the King's College Hospital Reports he contributed papers on psychological medicine in relation to the general practitioner, and on puerperal insanity. In the *Journal of Mental Science* he published papers on epilepsy connected with insanity, on the remodelling of old asylums, and on the care and treatment of persons of unsound mind in private houses and nursing-homes. Papers from his pen appeared in *The Lancet* on the association of insanity with myxœdema and on lunacy law reform, while in the *British Medical Journal* he summarised his war experiences with the Western Command in a paper on shell-shock and neurasthenia.

After his retirement from the City of London Mental Hospital he became a part proprietor of "Fenstanton," Christchurch-road, Streatham, in association with the late Dr. Henry Rayner and Dr. Outterson Wood, and continued his interest to the present time in this licensed home for 30 female mental patients. Latterly he lived at Shrewsbury and only occasionally visited London. But those of his contemporaries who remain and many of his old students remember him as a sound exponent of his subject.

ROBERT HERBERT MILLS-ROBERTS, C.M.G., F.R.C.S. Edin.

Robert Herbert Mills-Roberts, who died in a nursing-home at Bournemouth on Nov. 27th, was the son of Robert Roberts, J.P. of Plas Meinl, Festiniog, and was born in 1862. He received his medical education at St. Thomas's Hospital. He took the double English qualification in 1887, and in 1893 obtained the diploma of F.R.C.S. Edin. He held numerous residential appointments, being house officer at the Stroud General Hospital, the Birmingham General Hospital, the Leicester Infirmary, and the Royal United Hospital, Bath, and then went into practice in Wales as surgeon to the Dinorwic Hospital and quarries, Llanberis, a post which he held until the outbreak of the European war. When he joined up in 1914 the life of a military surgeon was not new to him as he had served with the Welsh Hospital in the South African war, when he was mentioned in dispatches and received a medal with clasps and the C.M.G. In the European war he did important service. Going out with the British Expeditionary Force he served throughout the whole period of hostilities, being at first second in command of the 6th Royal Welsh Fusiliers, and later officer commanding 131st Field Ambulance and the 41st Stationary Hospital with the rank of lieutenant-colonel. At the conclusion of hostilities he was appointed deputy commissioner, medical service, North Wales and Shropshire (Ministry of Pensions).

Colonel Mills-Roberts was widely known in the district where he resided, as his father had done before him, while in athletic circles half a century ago he was famous as a goalkeeper under Association rules. He was then a Welsh international player, and in 1888 kept goal for the Preston North End Club, when the club won the championship without having a goal scored against them.

REBUILDING OF QUEEN CHARLOTTE'S.—The Duke of York on Nov. 26th presided at a dinner held at the Grocers' Hall in aid of a fund for the rebuilding of Queen Charlotte's Maternity Hospital, London, which, when completed, will be the largest maternity hospital in the Empire. Building is to be started early next year and it is hoped to provide 230 beds with both public and private wards at a cost of £300,000. The first section, comprising 75 beds, will cost £80,000, and already a large proportion of this has been given or promised. The scheme includes a home for nurses and a hostel for students.

PANEL AND CONTRACT PRACTICE

The New Act

IN about a month's time approved societies will be busy issuing some 18 million health insurance contribution cards, for the first half-year of 1936, to their members. The Minister of Health has arranged for a special leaflet to be issued with each contribution card explaining the provisions made in the 1935 Act for continuing the insurance of persons who fall out of employment. In future, so long as an insured person remains entitled to sickness and disablement benefits, no reduction will be made in the rates of those benefits because he has been unemployed, provided that proof of unemployment is given to his approved society in good time, ordinarily by means of a franked contribution card. A person who had been continuously insured for ten years at the commencement of his "free insurance period" (which lasts from eighteen months to two years from cessation of employment) will have his insurance extended from year to year provided he continues to prove his genuine unemployment—again by means of franks. During these "extended insurance periods" he will remain a member of his society and will continue to be insured so far as pensions are concerned. He will lose his sickness and disablement benefits, but will retain medical, maternity, and any additional treatment benefits provided by his society. Many insured persons who had lost their title to medical benefit by reason of prolonged unemployment, under the 1932 Act, will be restored to benefit, but surely the super-optimist is the insurance practitioner who, assuming that every person who had ceased to be insured during the past three years would be reinstated in benefit, rang up his insurance committee to ask whether the limit of 2500 would be suspended so as to allow all his old patients to be restored to his list.

Certificates and Their Uses

There is an increasing tendency on the part of employers to inform their staffs that they may submit for inspection forms Med. 40 when absent from work owing to illness. The Manchester medical (and panel) committee recently took up the impropriety of a letter addressed by a local firm to their employees who are absent from work for some days owing to illness, requesting the employee to allow the firm to see the form Med. 40 obtained from the doctor. The panel committee requested the insurance committee to direct the firm's attention to the fact that insurance practitioners are required to issue medical certificates to their patients free of charge only for the purposes of National Health Insurance. The insurance committee decided to receive the panel committee's letter.

The "House Doctor"

The London panel committee have also been having a little trouble with a firm of employers. An insurance doctor had on his list a number, about one hundred, of the employees of a firm who resided in a hostel. The doctor sold his practice to another practitioner who learnt that the firm were exhibiting a notice in the hostel to the effect that in consequence of the resignation of Dr. A. it had been decided to transfer to Dr. C. (not the successor to Dr. A.'s practice), and accordingly it would be necessary for all medical cards to be handed in to the steward's office duly completed in part B. The successor endeavoured to persuade the firm to withdraw the notice, but the directors could not see their way to do so, whereupon the assistance of the local medical and panel committee was invoked. The committee got in touch with Dr. C. who stated that he had never visited the hostel and was unaware of the exhibition of the notice; he wrote to the firm asking that the notice should be removed and this was done. A representative of the firm stated that there was no compulsion upon any of their employees to transfer to Dr. C. and that they would be informed that they could choose any insurance doctor in the district. Later Dr. B. wrote to say that one of the two employees who had signed a statement that they wished to stay on his list had been dismissed, and that others whom he had asked to sign a similar statement had declined for fear of dismissal. Both Dr. B., the successor, and Dr. C., the "house doctor," appeared before the committee. Dr. B. brought no witnesses as he said the insured persons feared their appearance might jeopardise their positions with the firm.

Dr. C. stated that just after he had seen the secretary to the firm, and had agreed to act as medical adviser to the inmates of the hostel, he left London for his holiday. He had had no previous experience of insurance work and was quite unaware that his acceptance of the insured persons was detrimental to Dr. B. He was also unaware that a notice had been posted in the hostel until Dr. B.'s letter acquainted him of the fact. He called as witness the secretary of the firm, who confirmed everything that the doctor had said. The secretary explained that the sole desire of the firm was to see that their employees were on the list of an insurance doctor. He now realised that the exhibition of the offending notice was contrary to the National Health Insurance Acts, but he was not aware of this fact at the time the notice was exhibited. He added that no employee had been dismissed because she had signed a statement, but that one had been dismissed because she was unsatisfactory. The committee came to the conclusion that the canvassing which took place on Dr. C.'s behalf was entirely without his knowledge and consent, and they directed that this decision should be conveyed to all the parties concerned. The clerk of the insurance committee was however asked to communicate with the firm pointing out that the notice was an interference with the right of free choice of doctor conferred on every insured person by the National Insurance Acts and suggesting that a further notice should be exhibited in the hostel informing the employees that they are entitled to apply for admission to the list of any insurance practitioner without fear of penalty.

This was done and the firm readily concurred in the suggestion. But the incident illustrates the difficulty which sometimes occurs of convincing employers that although they pay a considerable proportion of the value of stamps affixed to contribution cards they have no right to interfere with any of the benefits conferred upon the insured person.

Incapacity after Confinement

Sickness or disablement benefit is in no circumstances payable to a married woman in respect of incapacity occurring during the four weeks following confinement. Unmarried women, on the other hand, although ordinarily disentitled to sickness or disablement benefit during those four weeks can be paid sickness or disablement benefit if it can be shown that the incapacity is not connected directly or indirectly

with the confinement. Section 13 (7) of the 1924 Act is the relative enactment on the subject. An insured person recently complained to the Scottish Department of Health that her insurance practitioner had refused to issue a certificate of incapacity for work to her. The reply of the doctor showed inter alia that three weeks after the confinement of the insured person, which took place in an institution, she requested him to give her a certificate of incapacity but that, having regard to the provisions which are set out above, he had refused to certify. Furthermore, any disability which the patient was suffering was due to her confinement three weeks previously and this confirmed him in his refusal to issue the certificate of incapacity. The patient's father later informed the doctor that the approved society were ready and willing to pay the benefit if he would issue the necessary certificates, whereupon he asked that this request might be put into writing. Needless to say, no such written request was forthcoming, but the patient's father returned to the doctor and stated that he would refer the matter to the Department of Health, in which course the doctor acquiesced. The insured person then went to the employment exchange and "signed on." A copy of the letter from the doctor was transmitted to the Department of Health, who replied that in the circumstances stated a certificate of incapacity on a date within four weeks after the date of the insured person's confinement was not required for National Health Insurance purposes and that the doctor was accordingly in order in refusing to issue such a certificate. The clerk of the insurance committee is now to write and request the observations of the approved society of which the insured person is a member. It is, perhaps, desirable that insurance practitioners should again be warned of the undesirability of paying too much attention to messages alleged to have emanated from approved societies or their representatives.

This occurred at Glasgow. The London panel committee has also taken note of the fact that although the certification of pregnancy has been eased of late the approved societies seem to have done nothing to curb the activities of their agents who continue to encourage pregnant women to apply for sickness benefit for a number of weeks before and after confinement. This action adds to the doctor's difficulty as the patient believes what she prefers to believe, especially when the agent's tale is in conformity with her own desires.

PUBLIC HEALTH

The River Tees : a Survey of Pollution

THE Water Pollution Research Board has just issued a second report [1] on the River Tees which was selected some time ago for close investigation as a typical polluted, but not too heavily polluted, river. The object of both these reports has been to find the effect of different sources of pollution and to determine to what extent the various discharges should be purified if serious pollution is to be avoided.

The present report concerns the tidal reaches of the Tees, which extend from High Worsall to the sea, a distance of about 25 miles, and include the water flowing past Stockton, where the industrial and urban features become marked, Middlesbrough and near Billingham. The salmon and trout fishery, once important, is declining, and it is evident that this is due mainly to sewage and industrial pollution. The nature of this and its effects on the chemical character of the water and on the varied flora and fauna have been investigated by a group of chemists and biologists, who have been able to compare their findings with those on unpolluted streams—the Tay and the Tamar—somewhat similarly situated with regard to the sea, that is, possessing like the Tees fairly well-defined fresh-water, brackish and marine regions. The Tees is a river in which fresh and salt water do not mix intimately; definite stratification occurs, the lighter fresh water floating over the salt water coming from or ebbing to the sea. It is remarkable that not only in the Tees but in the two other rivers the zone of greatest variation in salinity is also that of most restricted flora and fauna. Since, in the Tees, this zone is also that of maximum pollution the comparison is valuable as the sparsity of life might have been entirely attributed to pollution, whereas it is evidently in part due to the relatively few species which have been able to accommodate their mode of living to rapid changes of concentration of ions and consequent variation of osmotic pressure in the medium in which they live. That pollution also has some share in causing the relative absence of life in the Tees is shown by the very few fish and shrimps in the region in question.

The kinds of pollution reaching the Tees are very varied. The untreated sewage of 280,000 people is an important factor, but effluents from coke oven by-product works contribute approximately two tons of tar acids and a ton of cyanide daily. The effect of these rather active poisons on living things already debilitated by whatever specific toxic effect (if any) sewage may possess, and by its demands on dissolved oxygen (at times reducing the saturation of this gas in the water to 5 per cent. of that found in pure water in equilibrium with air) is obviously likely to be great. It appears that cyanides are more virulent than tar acids, although the experiments made for the Ministry of Fisheries several years ago showed tar acids to be very deadly to the trout at Alresford, Hants.

In the Tees, as we believe is the case in most polluted rivers, the variation of dissolved oxygen is seasonal. In summer, when the high temperature of the water increases the rate of biochemical action, the demand of organic polluting matters for oxygen approaches closely the rate of absorption of oxygen from the air, supplemented though this is by photosynthetic processes; the decreased fresh-water flow also leads to a more lengthy sojourn of polluting matters in the restricted waters of the river. In winter, slow rates of demand and high fresh-water flow allow a higher oxygen content.

This brilliant research, which is a fine example of what can be done by a group of allied workers in different fields, has not been confined to an investigation of conditions in the river, but has been supplemented by experimental work in the laboratory on the action of the relevant effluents and their constituents on various organisms and on the means of purification of effluents. These and other inquiries have thrown light on the problem of polluted rivers in general and the means of restoring them to some-

(*Continued at foot of opposite page*)

[1] Department of Scientific and Industrial Research, Water Pollution Research Board, Technical Paper No. 5, Survey of the River Tees. Part II. The Estuary—Chemical and Biological. By W. B. Alexander, B. A. Southgate, and R. Bassindale. H.M. Stationery Office. 9s.

GENERAL MEDICAL COUNCIL

WINTER SESSION, NOV. 26TH–DEC. 3RD, 1935

Penal Cases Referred by the Dental Board

The Case of Aaron Leslie Barnett, registered as of 5, Robert-street, Londonderry, "Dentist 1921," the erasure of whose name from the Dental Register was recommended after investigation of the following charge :—

That being a registered dentist you have canvassed for the purpose of obtaining patients and in particular in or about the month of March, 1934, canvassed Mrs. Ruby Hutton and subsequently extracted her teeth and supplied her with a denture.

Mr. Barnett attended and was represented by Mr. Ifor Lloyd, counsel, instructed by Mr. Meyer Cohen, solicitor. Mr. Lloyd addressed the Council, pointing out that the only evidence before the Board had been an illiterate woman from Londonderry and a "free sample" post card ordering ¼ lb. of Ty.phoo tea to be sent to her on Mr. Barnett's recommendation. After deliberation in camera the President announced that the Registrar had been directed to erase Mr. Barnett's name from the Dental Register.

The Case of William Ainslie Duncan, registered as of 5, Myrtle-street, Glasgow, "Dentist 1921," who had appeared before the Dental Board on the charge :—

That being a registered dentist : (1) You have permitted an unregistered person—namely, Daniel MacLachlan, to practise dentistry in your name, and in particular in connexion with the dental treatment of Wilhelmina Davidson and Robert Kelly, and that you have thereby enabled the said Daniel MacLachlan to practise as if he were registered. (2) You have assisted, counselled, and encouraged an unregistered person—namely, Daniel MacLachlan, to practise dentistry for your own benefit.

The Dental Board had found the charges proved and recommended the erasure of Mr. Duncan's name.

Mr. Duncan was not present, nor was he represented. After deliberation in camera the President announced that the Registrar had been directed to erase his name.

Penal Cases Adjourned from Previous Sessions

The Council then proceeded to the consideration, adjourned from May 28th, 1935, of the *Case of Aldo Castellani*, registered as of 23, Harley-street, London, W.1, Hon. K.C.M.G., M.D. Univ. Florence, 1899; M. 1906, F. 1922, R.C.P. Lond., who had been summoned to appear before the Council on a charge of infamous conduct in a professional respect. Sir Aldo appeared and was accompanied by Mr. T. Carthew, counsel instructed by Messrs. Le Brasseur and Oakley, solicitors for the London and Counties Medical Protection Society. Mr. G. O. Slade, counsel instructed by Messrs. Pennington and Son, appeared for the complainant and applied to the Council for a hearing in camera. Mr. Carthew opposed this application as his client wished the charges to be heard in public to avoid misunderstanding. The Council decided to hear the case in camera, and after the hearing the President announced that the charges had not been found proved.

New Penal Cases

A CHARGE OF PROFESSIONAL MISCONDUCT

The Case of Dorothy Miller, registered as of Hollyburn P.O., West Vancouver, B.C., Canada, M.B., Ch.B. 1916, U.Glasg., who had been summoned to appear before the Council on the following charge :—

That being a registered medical practitioner you abused your position by committing adultery with Roy Keating Clay, who and whose wife were patients of yours, of which adultery you were found guilty by the decree of the Supreme Court of British Columbia in Divorce and Matrimonial Causes dated June 14th, 1934. And that in relation to the facts so alleged you have been guilty of infamous conduct in a professional respect.

The complainant was Mrs. Alice Keating Clay.

Complainant and respondent did not appear, but the latter was represented by Mr. W. G. Fordham, Council, instructed by Messrs. Johnson, Jecks, and Colclough.

Mr. Winterbottom put in the documents of complainant's case and a transcript of the divorce case. Mrs. Clay had declared, he said, that during their residence in West Vancouver Dr. Miller had attended them professionally from March, 1929, and they had called her in without previous acquaintance. Accounts had been rendered and paid by both husband and wife. Mr. Clay had been attended continuously for paratyphoid in 1929. In 1930 Dr. Miller had taken Mr. Clay in her own car to hospital for a diagnostic test; for this he had paid by cheque. Copies of prescriptions were exhibited. Dr. Miller's reply was that prescriptions were generally dictated by telephone in West Vancouver and she had often telephoned the drug store on behalf of friends and patients. She did not consider that this constituted professional relationship. Friends and patients often telephoned repeat orders of prescriptions. Mr. Winterbottom suggested that one or two of the prescriptions were not such as a layman could telephone. In 1930 Mr. and Mrs. Clay had gone to China for a trip and before their departure Dr. Miller had refused to accept payment on the ground of friendship. They had therefore brought back presents for the doctor from China, and had subsequently given her gifts.

Mr. Winterbottom read five statutory declarations from friends of the Clays, confirming that Dr. Miller had been regarded as the family doctor, and that the first introduction had been a professional one. One writer declared that the Clays had been a model couple until the doctor had come between them. The divorce case had been heard on June 4th, 1934. Mr. Clay had there said that trouble between him and his wife had started about two years before. Mr. Clay had declared that his wife refused to divorce him for any offence other than those with Dr. Miller.

Mr. Fordham then addressed the Council and submitted that when a case of this kind depended solely on affidavit, the charges ought to be very thoroughly proved. It was unfortunate that the evidence of Mrs. Clay and two of her witnesses had been sworn before a notary who was a partner in the firm of solicitors employed by her. He read two statutory declarations, from a Mr. and Mrs. Glover, wherein it was stated that Mrs. Clay and her lawyer had brought much pressure to bear on them to sign affidavits of which they did not approve. Mrs. Glover had no knowledge of any treatment of Mr. Clay

(*Continued from previous page*)

thing like a normal condition. It is hardly too much to hope that in time to come these workers will be reporting on a restored Tees, again full of fish, whilst still supporting flourishing industries. This is the raison d'être of the Water Pollution Research Board.

by Dr. Miller or of any improper conduct. Mrs. Clay and her lawyer separately had told Mrs. Glover she was their only witness and she must come, and the latter had offered to pay for them what they owed to Dr. Miller if Mrs. Glover would go and "sign the papers we want." The lawyer had become very angry and had said: "We are going to get Dr. Miller out of the profession, even if she is a good doctor, but to do that we must have Mrs. Glover's affidavit." Mrs. Glover had been working in the Clays' house from 1929–1931. Mr. Fordham argued that at the time of the alleged offence the relationship of doctor and patient had long ceased to exist. The parties had been on terms of social intimacy. The first charge of misconduct was 1934. The only professional accounts paid had been on behalf of the wife, not the husband, and all treatment had ceased in 1932. Mr. Clay had called in another doctor in 1929 and 1931. If relation of doctor and patient were ever to cease, Mr. Fordham argued, there could be no more potent test than the consultation of another doctor. Mrs. Clay had not contemplated divorce proceedings (which had in fact been taken) but had preferred to report the matter to the Council. Dr. Miller claimed that she was continually meeting these people and they were continually asking her what to use for various minor ailments; the prescriptions put in evidence were the result of telephone messages, written out by the chemist for his records. The only presents given to respondent were given in 1930 and could not therefore refer to the alleged professional attendances in 1931 and 1932. It was admitted that the parties met for the first time on a professional basis, but this had ceased at the end of 1929 and had never been resumed. It was common ground that it had ceased in 1932. The adultery in 1934 had no sort of relevance to the opportunities of the doctor during professional attendance in 1929. With a woman doctor the circumstances were in the very nature of things different from the abuse by a man of privileged access to the bedside of a woman patient. No opportunity had been abused here and no trust broken.

Mr. Winterbottom, replying, pointed out that six prescriptions had been given within 21 days, but agreed that there was no evidence of remuneration after the first two payments of 9 dollars.

After deliberation in camera the President announced that the Council had not seen fit to direct the erasure of Dr. Miller's name.

CHARGES OF DRUNKENNESS

The Case of Florence Joseph O'Driscoll, registered as of West House, Ramsey, I.O.M., M.B., B.Ch. 1928, N.U.Irel., who had been summoned to appear before the Council on the following charge:—

That you were convicted: (1) On August 3rd, 1931, at the Clerkenwell Police-court, of being drunk, and were fined 10*s.* and 11*s.* costs, or seven days' imprisonment; (2) On August 16th, 1933, at the Liverpool City Police-court, of being drunk and incapable, and were fined 10*s.* or ten days' imprisonment; (3) On July 30th, 1935, at the Liverpool City Police-court, of being drunk and disorderly, and were fined 40*s.* or one month's imprisonment.

Mr. O'Driscoll appeared, but was not accompanied by any legal representative. Mr. F. P. Winterbottom, solicitor to the Council, put in the charges and police reports and read correspondence about the case. Respondent had pleaded loss of sleep and promised complete abstention after the second conviction. In the third conviction respondent had been arrested in company with a woman who had previous convictions for indecent conduct and prostitution.

Mr. O'Driscoll addressed the Council, pointing out that at the material times he had not been engaged in medical work. The woman had accosted him and, before anything else could happen, the policeman had arrived. He expressed his deep regret and promised to abstain in future.

After deliberation in camera the President announced that the Council had decided to postpone judgment for twelve months subject to the usual provisos as to testimonials and good conduct in the meanwhile.

The Case of John McCarren, registered as of Brookvale, Cavan, L., L.M. 1926, R.C.P. Irel.; L., L.M. 1926, R.C.S. Irel., who had been summoned to appear before the Council on the following charge:—

That you were convicted at the Liverpool City Police-court: (1) On April 2nd, 1930, of being drunk and disorderly, and were fined 20*s.* or 11 days' imprisonment; (2) On Jan. 13th, 1932 (in the name of John Patrick McCarren), of being drunk and disorderly, and were fined 15*s.* or six days' imprisonment; (3) On April 30th, 1935 (in the name of John Gerard McCarren), of being drunk and incapable, and were fined 10*s.* or six days' imprisonment; (4) On May 2nd, 1935 (in the name of John Gerard McCarren), of being drunk and incapable, and were fined 20*s.* or 11 days' imprisonment.

Mr. McCarren did not appear, nor was he represented. Mr. Winterbottom laid the facts and correspondence before the Council. Respondent had written that he had not practised medicine, except for a few days, during the previous year and that he had no intention of practising, except in case of war, in the near future. He sent testimonials from the Cavan Board of Health.

After deliberation the President announced that the Council had postponed judgment until November, 1936, subject to the usual provisos; it would be desirable in his own interest that Mr. McCarren should then attend.

The Case, adjourned from Nov. 28th, 1934, *of George Francis Maher*, registered as of Ballymore House, Goold's Cross, Co. Tipperary, L.R.C.P. Edin. 1925; L.R.C.S. Edin. 1925; L.R.F.P.S. Glasg. 1925, who had been summoned to appear before the Council on a charge of having been convicted twice of driving a motor-car under the influence of drink. Judgment had been postponed.[1]

Mr. Maher attended, and Mr. Winterbottom read three testimonials to his conduct. After deliberation the President announced that the Council had decided not to erase Mr. Maher's name from the Register.

The Case of Robert Louis Portway, registered as of c/o Westminster Bank, 34, Borough High-street, London, S.E.1, M.R.C.S. Eng. 1916; L.R.C.P. Lond. 1916; D.P.H., R.C.P.S. Eng. 1921, who had been summoned to appear before the Council on the following charge:—

That you were convicted: (1) On June 11th, 1930, at Bow-street Police-court, of exceeding the speed limit in a motor-car, and were fined 15*s.*; (2) At the County of London Sessions commencing on Oct. 20th, 1931, of driving a motor-car whilst under the influence of drink, and were fined £50 and £25 costs and disqualified for holding a driving licence for five years; (3) On May 28th, 1935, at the Marlborough-street Police-court, of being drunk and disorderly, and were fined 20*s.* and 10*s.* 6*d.* costs.

Mr. Portway appeared, accompanied by Mr. Oswald Hempson, solicitor. Mr. Winterbottom put in the convictions and read correspondence. Mr. Hempson objected to the introduction of police

[1] THE LANCET, 1934, ii., 1284.

reports. The Legal Assessor said that it was the practice of the Council to accept such reports rather than bring police officers to give evidence, but if Mr. Hempson maintained his objection he would have to rule the statements of police officers out of order. Mr. Hempson did not press his objection, but said that if they were read he would have to call his client to refute them.

Mr. Portway, giving evidence, explained that at 1 o'clock on the night of May 28th he was returning from a dance and was accosted by two prostitutes. He had crossed to the point duty policeman to complain and by the time the policeman looked round the women had gone away and the policeman had taken him straight to the station. He admitted having taken some drink and having lost his temper. He had been very worried on that day by a quarrel with his only surviving relative, but since then he had been very moderate in drinking and was determined to go straight in future. In answer to the President, he said he was not now in practice. Mr. Hempson briefly addressed the Council and put in testimonials to Mr. Portway's character.

After deliberation in camera the President announced that the Council took a grave view of such offences, but had decided to postpone judgment for twelve months.

RESTORATIONS

The President announced that the Council had decided to restore to the Medical Register the names of James Lionel Bocarro, Philip Henry, and Harry Rubinstein.

INFRINGEMENT OF D.D.A. REGULATIONS

The Case, adjourned from May 29th, 1935, *of Valentine Robert Hirsch*, formerly registered as of 70, Westbourne-terrace, W.2, and now registered as of 17, St. Stephen's-square, W.2, M.R.C.S. Eng. 1916; L.R.C.P. Lond 1916, who had been summoned to appear before the Council on the following charge :—

That you were on Oct. 31st, 1934, convicted at the Marylebone Police-court of the following misdemeanours, viz: (1) That being a person authorised to prescribe for dangerous drugs, you did fail to comply with the Regulations (date of offence, July 18th, 1934), and were fined £5 and 3 guineas costs; (2) That being a person authorised to prescribe for dangerous drugs, you did fail to comply with the Regulations (date of offence, August 24th, 1934), and were fined £5; (3) That being a person authorised to prescribe for dangerous drugs, you did fail to comply with the Regulations (date of offence, Sept. 17th, 1934), and were fined £5.

At the conclusion of the hearing on May 29th, 1935, when Mr. Hirsch was not present and was not represented, the President announced that the Council had decided to adjourn the consideration of the case until the November Session.

Mr. Hirsch now attended, accompanied by Dr. R. J. Hearn, Counsel.

Mr. Winterbottom outlined the case against respondent and Dr. Hearn addressed the Council, saying that respondent had really thought he was doing a service to the patient who was matron of a nursing-home. He had acted foolishly and unthinkingly.

Mr. Bone inquired which regulation had been infringed, and this was ascertained. He also asked if any application had been made to the Home Office for restoration of the licence, and Dr. Hearn replied that Mr. Hirsch was awaiting the result of this case.

After deliberation in camera the President said that the convictions proved that respondent had not appreciated his responsibilities under the Act; nevertheless, the Council had not decided to direct the Registrar to remove his name, trusting that these convictions would be a lesson to him.

ALLEGED MISCONDUCT

The Case of Frank Beauchamp Martin, registered in the Colonial List as of c/o Westminster Bank, Haymarket, London, S.W.1, M.B., B.S. 1908, U.Melb.; F.R.C.S. Eng. 1919, who had been summoned to appear before the Council on the charge that being a registered medical practitioner he had abused his position by improper relations with a patient on various occasions between January, 1933, and January, 1935, during which period she was under his care, and that in relation to the facts so alleged he had been guilty of infamous conduct in a professional respect.

The respondent appeared, accompanied by Mr. O. Hempson, for the Medical Defence Union, and complainant was represented by Mr. W. A. L. Raeburn, counsel, instructed by Messrs. Julius White and Bywaters. The case, on the application of complainant's counsel, was heard in camera. After a hearing of two whole days, the President announced late on Monday night that the Council had not found the charges proved to its satisfaction.

Registration of Foreign Dentists

THE DENTAL EDUCATION AND EXAMINATION COMMITTEE had before it an unusually large number of applications for registration by foreign dentists. Sections 9 and 10 of the Dentists Act, 1878, enable the Council to authorise the registration in the Dentists Register as foreign dentists (without further examination in the United Kingdom) of persons who are not British subjects, or who have practised for more than ten years outside the United Kingdom, provided they have obtained some recognised certificate granted in a foreign country entitling its holder to practise dentistry or dental surgery and furnishing sufficient guarantees of the possession of the requisite knowledge and skill for its efficient practice. Should the foreign degree or qualification not appear in the list (on page lxxviii of the Dentists Register) the Council requires from the applicant such information as may enable the Council to determine whether the degree or qualification has been granted after a course of study and examination substantially equivalent to those required of candidates in this country. Having satisfied the committee in these particulars the following applicants are to gain access to the foreign list of the Dentists Register.

Adler, Max Martin, D.M.D. U.Wurzburg, 1924.
Auerbach, Richard, D.M.D. U.Frankfurt, 1921.
Baschwitz, Ernst, D.M.D. U.Berlin, 1922.
Becker, Victor, D.Phil. U.Berlin, 1902.
Block, Curt, D.M.D. U.Wurzburg, 1921.
Blumenau, Ernst, M.D. U.Frankfurt, 1919.
Borchartd, Max, D.M.D. U.Greifswald, 1920.
Borkon, Bernhard, D.M.D. U.Koenigsberg, 1931.
Brandt, Lili (formerly Blumenthal), D.M.D. U.Wurzburg, 1931.
Brann, Curt Harry, D.M.D. U.Berlin, 1920.
Brück, Walther Wolfgang, D.M.D. U.Breslau, 1925.
Calmsohn, Curt, D.M.D. U.Frankfurt, 1921.
Cohn, Erich, D.M.D. U.Koenigsberg, 1922.
Ehrmann, Sacki, D.M.D. U.Frankfurt, 1921.
Engel, Richard, D.M.D. U.Wurzburg, 1921.
Grundmann, Margarete (formerly Bernstein), D.M.D. U.Frankfurt, 1929.
Herzberg, Leo, D.Phil. U.Berlin, 1914.
Herzfeld, Kurt, D.M.D. U.Hamburg, 1927.
Isakowitz, Erich, D.M.D. U.Koenigsberg, 1921.
Josephs, Olga (formerly Herzberg), D.M.D. U.Wurzburg, 1920.
Kaliski, Wilhelm, D.M.D. U.Cologne, 1930.
Kallmann, Ernst, M.D. U.Frankfurt, 1920.
Kapp, Fritz, D.M.D. U.Wurzburg, 1921.
Karp, Jakob Leon, D.M.D. U.Berlin, 1920.

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AGRANULOCYTOSIS AND AMIDOPYRIN

DISCUSSION AT AN INQUEST

AT an inquest on the body of Harriet Jane Julier, heard on Dec. 3rd by the coroner for Shoreditch, Dr. R. L. Guthrie, sitting with a jury, a suggestion that the deceased's death from agranulocytosis had been caused by taking Yeast-Vite was held to be disproved.

The deceased was a married woman of 55, with two children, who had enjoyed good health, but during the last two or three years had suffered from colds. About Christmas, 1933, she had "come out in spots," a condition which was said to be due to food-poisoning. A little later she had developed a sore-throat, but a swab was found negative to diphtheria. Her present illness had begun about four weeks before her death. She had suffered from backache, for which a belladonna plaster had been applied, and afterwards she had complained of feeling "queer all over." A swelling had appeared in the left cheek and increased in size and painfulness; she complained of headache and vomiting. On Nov. 11th she had a temperature of 104° and was taken to a fever hospital on her doctor's certificate as a case of mumps and parotid abscess. Next day she was transferred to Bethnal Green Hospital, where she died. According to her husband she had not been accustomed to take medicine often, but she had taken Yeast-Vite tablets for headache or colds, one or two at a time at irregular intervals. She had not taken any for three weeks before her death.

Dr. A. Norman Jones, one of the staff of Bethnal Green Hospital, after outlining her history, said in evidence that she had been operated on to drain the parotid swelling, which had yielded serum but very little pus. On Nov. 13th the temperature was still high and rose further in the evening. Blood examination showed plentiful streptococci, with a number of *Staphylococcus aureus* and scanty pneumococci. Red cells numbered 3,700,000; hæmoglobin, 76 per cent.; colour-index, 1·0 and the white blood-cells only 600, the differential counts showing polymorphonuclear leucocytes 28 per cent., large lymphocytes 25 per cent., small lymphocytes 46 per cent., and large hyaline cells 1 per cent. A diagnosis of agranulocytosis was made. In spite of injections of Pentnucleotide and blood transfusions the septicæmia grew worse, the white blood-cells diminished to 450 and the patient died on Nov. 19th after a severe rigor.

Dr. F. Temple Grey stated that he had performed a post-mortem examination. Understanding that the case had been reported as one of agranulocytosis possibly due to Pyramidon Camidopyrin, he had made a further examination of the blood. He commented that the condition was not by any means a complete agranulocytosis such as might be found as a result of pyramidon poisoning, but should rather be described as "oligogranulocytosis." In the cases reported by Plum (THE LANCET, 1935, i., 14) there had been no granulocytes at all. He pointed out that Evipan, which had been used at the operation, might also cause a fall in the leucocyte count. The deceased had suffered from severe dental sepsis causing septicæmia, and, if an accelerating cause were sought, it was rather to be found in the surgical intervention. In reply to counsel appearing on behalf of Yeast-Vite Ltd., he stated that there was nothing to indicate that the yeast-vite tablets had been in any way responsible for the condition. The deceased had died from septicæmia caused by dental sepsis, which had brought about a diminution of the white cells. It was not conceivable that the condition disclosed by the autopsy could have been caused by her occasional use of yeast-vite tablets.

Dr. S. H. Ryffel, who had analysed the organs and a bottle of yeast-vite tablets, said that he had obtained from the organs a small yield of a basic substance similar in its properties to pyramidon. The tablets had weighed grs. 5 each and had contained pyramidon in the proportion of 12·8 per cent.—practically the same as the percentage disclosed on the bottle. They also contained live yeast cells, caffeine, phenacetin, potassium, and ammonium bromide, sodium bicarbonate and a flavouring. In his opinion the pyramidon he had found in the organs might have reduced the white cell count and therefore lowered the resistance to infection. The finding would point to retention of pyramidon in the body for a long period; he could not say now long it was usually retained. The formula disclosed on the bottle contained, instead of the term "pyramidon," the technical name dimethylaminophenyldimethylisopyrazolone. The use of the long name for the drug was "completely deceptive to the public" and the ordinary man in the street would have no idea what it meant. Cross-examined, he said that chemists and medical men recognised the name as synonymous with pyramidon. The dose of pyramidon in the B.P. 1932 was five to ten grains, which could be taken three times a day. Each tablet of yeast-vite only contained five-eighths of a grain.

Sir William Willcox, giving evidence on behalf of the Yeast-Vite Company, said that pyramidon or amidopyrin had for many years been used as a remedy for headache and pain. Only quite recently had it been found in association with agranulocytosis. Certain persons—perhaps one in every thousand—were sensitive to the drug; perhaps every drug had a similar proportion of persons who were sensitive to it. The patient had died from acute septicæmia due to staphylococci from her teeth. The evidence of the autopsy and of the hospital physician were

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Kirschstein, Stephanie Eleonor (formerly Jacobson), D.M.D. U.Berlin, 1927.
Lachs, Erna (formerly Höchstädter), D.M.D. U.Wurzburg, 1931.
Levy, Max, D.M.D. U.Halle-Wittenberg, 1919.
Lewy, Egon, D.M.D. U.Bonn, 1931.
Magnus, Ernst Joachim, D.M.D. U.Freiburg, 1933.
Mayer, Ernst, D.M.D. U.Frankfurt, 1922.
Mueller, Herbert, D.M.D. U.Berlin, 1933.
Münzesheimer, Walter, D.M.D. U.Berlin, 1925.
Neubürger, Salli, D.M.D. U.Wurzburg, 1922.
Pfeffer, Ernst, D.M.D. U.Berlin, 1920.
Philips, Richard, D.M.D. U.Bonn, 1927.
Prager, Christian Albert Otto, D.M.D. U.Cologne, 1921.
Rosenberg, Leo, D.M.D. U.Wurzburg, 1921.
Rosenkranz, Alfred, D.M.D. U.Wurzburg, 1922.
Rosenstrauch, Arnold, D.M.D. U.Berlin, 1934.
Rosenthal, Trude, D.M.D. U.Bonn, 1929.
Rothschild, Albert, D.M.D. U.Berlin, 1922.
Rummelsburg, Jacob, D.M.D. U.Greifswald, 1920.
Sahmer, Max, D.M.D. U.Frankfurt, 1922.
Salisch, Kate (formerly Frankel), D.M.D. U.Breslau, 1921.
Salisch, Max Alfred Willy, D.M.D. U.Breslau, 1921.
Samson, Erna Helene (formerly Süssmann), D.M.D. U.Munster, 1933.
Samuel, Adolf, D.M.D. U.Frankfurt, 1920.
Schindler, Adolf, D.M.D. U.Berlin, 1923.
Schmeidler, Rudolf, D.M.D. U.Wurzburg, 1922.
Schüler, Berthold, D.M.D. U.Cologne, 1921.
Selo, Gerda, D.M.D. U.Frankfurt, 1923.
Silbiger, Wilhelm, D.M.D. U.Wurzburg, 1923.
Springer, Hans, D.M.D. U.Wurzburg, 1920.
Strauss, Bruno, D.M.D. U.Frankfurt, 1921.
Türkheim, Hans, D.M.D. U.Hamburg, 1921.
Waldsachs, Hildegard (formerly Cahn), D.M.D. U.Bonn, 1933.
Waldsachs, Reinhard, D.M.D. U.Bonn, 1931.
Walter, Max, D.M.D. U.Erlangen, 1925.
Weinsberg, Norbert, M.D. U.Vienna, 1925.
Wongtschowski, Karl, D.M.D. U.Berlin, 1923.
Worms, Alfred, D.M.D. U.Wurzburg, 1921.

quite against the suggestion that the death was due to amidopyrin. The exudate on the tonsils found in amidopyrin deaths was lacking; moreover, the granular cell count should have been nil if the death had been due to the drug. The urine had been almost clear, whereas in a case of amidopyrin poisoning it would have taken on a brick-red colour. The drug had not in his opinion accelerated death at all.

Mr. F. E. Hemsley, managing director of Yeast Vite, Ltd., testified that the tablets made since June had not contained any amidopyrin. He had used the long name for the drug purely on the advice of his chemists, and it had not occurred to him that it was in any way deceptive.

The jury returned a verdict of death from natural causes, due to blood poisoning caused by pyorrhœa.

CORRESPONDENCE

EXPLOSION IN OPERATING THEATRES

To the Editor of THE LANCET

SIR,—The Medical Research Council has requested the assistance of the National Physical Laboratory, through the Department of Scientific and Industrial Research, to look into the subject of the electrification of equipment used in operating theatres. Electrification by frictional means, producing considerable static voltages, is regarded as a very serious risk in America; and, though the risk appears to be much less in this country, in which the atmosphere is not so dry, one or two serious explosions of anæsthetic gases have occurred, which have been ascribed to sparks due to the sudden discharge of electrified equipment. The importance and want of definite knowledge on the subject has induced the Medical Research Council to ask for more information on the nature of the risk and on possible methods of prevention.

The inquiries which have so far been made have shown that the staff of operating theatres have occasionally received uncomfortable electric shocks from such apparatus as anæsthetic couches; these, as experiment has shown, can become electrified to such an extent that the discharge in the form of a spark is sufficient to ignite an anæsthetic such as ether and oxygen. There is also the possibility of electrification being generated by the use of modern anæsthetic apparatus. It has been found that the staff of operating theatres are likely to experience cases of electrification which do not come to the notice of the medical staff, as their duties are more likely to include the movement of blankets, mattresses, and the like, which may give rise to electrification.

Superintendents of hospitals are invited to collect information of electrification of this nature and to forward it to the Laboratory to assist in determining the conditions in which it may arise, and the means by which it may be avoided. Such information should be addressed to the Director, The National Physical Laboratory, Teddington (Msx.). Similar information from private practitioners would also be welcomed.—I am, Sir, yours faithfully,

J. E. PETAVEL,
Director.

Dec. 2nd.

TEACHING OF MEDICAL PSYCHOLOGY

To the Editor of THE LANCET

SIR,—The leading article in your issue of Nov. 23rd is deserving of some attention. As you state—"The teaching of psychological medicine as a whole is becoming more and more plainly a necessary part of medical education . . . and will be taught best by those who have the widest experience." The medical student and the general practitioner must be able to detect and handle with discretion the psychological and social problems which play so important a part in the illness of a great proportion of the patients of every practice, and of those in the out-patient departments and wards of every general hospital. The physicians and surgeons who teach medicine have themselves a knowledge of these problems, but have they sufficient time and opportunity to investigate them adequately, and therefore to explain the actual part they are playing in the illness of so many of the patients under their care? Have they the time to gain the full confidence of the nervous patient, to interview the nearest relative or relatives when necessary, and to obtain or even to read an adequately prepared history of the illness of a patient whose symptoms are the expression of an underlying neurosis?

The method of education recommended by the conference of representatives nominated by the universities of Oxford, Cambridge, and London, the Royal Colleges of Physicians and Surgeons, and the Society of Apothecaries, needs a proper trial in the United Kingdom. It has worked with undoubted success in certain hospitals in America and Australia, and has been given encouragement in some hospitals in Great Britain. Quoting from the report of the conference:

"A series of demonstrations should be held at least once a fortnight throughout the student's period of in-patient clerking and in-patient dressing. It is recognised that there are many patients in every ward suitable for investigations and demonstrations of this kind, but that a considerable amount of time is required for their preliminary study before they can be used for purposes of teaching. In some medical schools such demonstrations have long been in force with great success, and it is submitted that the physician or surgeon in charge of the ward may undertake them himself or may hand over that duty to a colleague who is attached to the hospital for the purpose of teaching medical psychology.

"In this way the teacher of medical psychology is able to draw upon the material in the hospital as a whole for teaching purposes, and by selecting patients whose condition is not primarily one of mental disorder, the psychological features of any sick man, woman, or child can be brought to the notice of the medical student in proper perspective."

Surely all teaching hospitals should appoint physicians with a special interest in psychiatry to organise active departments of psychiatry, and to assist the general physicians and surgeons in the investigation and demonstration of such material in their wards. These members of the teaching staff should have been trained, first as physicians with a knowledge of neurological anatomy and clinical neurology, and secondly as psychiatrists with experience in mental hospitals for the understanding of the psychoses, and in the psychiatric departments of general or special hospitals for dealing with the neuroses. A broad training covering all of these fields, together with the association with other physicians and surgeons in general hospitals or in consulting practice, prevents such psychiatrists from adopting any of the extreme points of view which, in the past, have made many of their professional brethren doubtful about the wisdom of allowing any colleague who is associated with the term "medical psychology" to teach students.

As your article states, such fully equipped teachers are available; but are their services being used by the teaching hospitals? Until they are, the student cannot be given an adequate background of training to prepare him to meet the problems which will confront him in any branch of clinical medicine or surgery which he will follow later. The public will continue to be inadequately served, and the charlatan will continue to flourish.

I am, Sir, yours faithfully,

Brook-street, W., Dec. 3rd. RALPH A. NOBLE.

To the Editor of THE LANCET

SIR,—Your leading article of Nov. 23rd suggests that there is considerable disagreement about the teaching of medical psychology. The controversy which rages in various sections of the lay press shows that the general public feels a certain amount of dissatisfaction with the diagnosis and treatment of mental illness. It would seem to me that these two things are related. We do not know enough about medical psychology, psychopathology, and psychotherapy—particularly in relation to the psychoses. There is an urgent need for research. The research which is performed in mental hospitals is mainly done from an organic point of view and the work is carried out by an enthusiastic junior—the senior is awaiting the coming of a clinical nirvana in the shape of a superintendentship. On the other hand, the psychotherapist who works outside a mental hospital must, by the nature of his work, pass long hours in his consulting-room and has little time to correlate his findings. It is a pity that we have no proper organisation to encourage research in psychological medicine, and that there is no honour or prize, not necessarily of monetary value, given for the best research of the year. As it is, the research worker is never able to feel that his work is appreciated.

To me Dr. Ross is sugaring his pill so much that it is all sugar. Why should only that psychology which is acceptable "to all intelligent persons" be taught? Would any other branch of medicine accept such a restriction? Are there no other "warring schools" in any other branch of medicine? It would be more reasonable to teach impartially the different doctrines and let the student select what he feels is of value in exactly the same way as he does in any other branch of medicine. In any case the schools war on philosophical grounds and these are of less interest to the clinician than technical psychotherapy. A great deal of harm has been done to psychology by not emphasising to the student that the function of analytical psychotherapy is really to release emotion and that the sole aim in exploring the unconscious is to do this. If students were taught how to diagnose properly, then, when they became practitioners, they could sort out and treat the anxiety states and other minor surgery of the mind while passing on to the specialist the prepsychotics, severe hysterics, obsessionals, &c., for more severe operations.

It is better for the practitioner to learn to treat those cases which yield easily to treatment and not to attempt the more difficult ones. Every student should leave hospital with the knowledge how to do a simple analysis. If he uses this knowledge he will acquire a wisdom which will enable him to pick what he needs from the various schools of psychological thought.

I am, Sir, yours faithfully,

Harley-street, W., Nov. 29th. CLIFFORD ALLEN.

THE MEDICAL REGISTER

To the Editor of THE LANCET

SIR,—I am directed by the President of the Council to say that he would be glad if you could publish this intimation that any orders for the office edition of the Medical Register, 1936, published by the Council at the special price of 10*s.* a copy, post free, must be received, with a remittance, at the office of the Council not later than Dec. 31st, 1935.

The office edition differs from the ordinary edition of the Register to the extent that it does not contain reprints of the Medical and Dentists Acts and other preliminary matter, and is printed on more inexpensive paper and bound in boards. It includes, however, the same entries relating to registered medical practitioners as are included in the ordinary edition, and is therefore equally serviceable to public authorities and others who find it necessary to ascertain whether particular persons are registered medical practitioners or not.

I am to take the opportunity of stating that the Council also prepare monthly lists of names added to, and removed from, the Register, and that particulars of the terms and conditions upon which copies of these lists may be made available can be obtained on application to the office of the Council.

I am, Sir, yours faithfully,

MICHAEL HESELTINE,
Registrar, General Medical Council.
44, Hallam-street, Portland-place, London, W., Dec. 2nd.

CAUSES AND TREATMENT OF OBESITY

DR. H. W. HALES writes:—May I make some corrections of your summary of my remarks at last week's meeting of the Section of Medicine of the Royal Society of Medicine? You stated that I viewed obesity as a symptom of oxidation deficiency produced by tissue and intestinal poisons; I actually said "by the combined action of food toxins and intestinal poisons." Again, you said: "There were certain toxic principles in food, especially meat, of which avenin was an important example." *Avenin* should read *arginine*. As is well known, arginine is an amino-acid which, according to Edlbacher and Mertz, is present in a very high concentration in cancerous tissue. It has been shown that inoculated cancerous growths in animals are speeded up by the injection of arginine, but are retarded by thyroxine. (Cf. Gilroy's articles in *Biochemical Journal*, 1930–31.) This suggests a reason for the value of thyroid and potassium permanganate in many chronic conditions, especially those involving the liver or ductless glands. Cancer seems to be progressing rapidly in meat-eating countries, and so the question of arginine appears to be of increasing importance. (I am indebted to Mr. C. B. Voge, Ph.D., for my information on this subject.) You have quoted me as saying that "Hunger was analogous to the withdrawal symptoms felt by drug addicts." The context showed that hunger referred to the particular craving for food experienced at the beginning of a fast, and it should be differentiated from the irresistible hunger which arises at the successful completion of such treatment. Lastly, I said "colonic detoxication by lavage with potassium permanganate as originally described by Nott." I do not find that other solutions are of much value.

HOSPITAL EXTENSIONS AT STROUD.—The county public assistance committee, on Nov. 19th, approved a scheme to spend £28,000 in remodelling and extending the Stroud Public Assistance Institution. A hospital block with 109 beds, a laundry, a dining-room, and alterations in the nurses' quarters are included in the plans.

MEDICAL NEWS

University of Cambridge

On Nov. 30th the following degrees were conferred :—

M.D.—E. H. Willoughby Lyle and T. K. S. Lyle.
M.B., B.Chir.—C. L. Collins, J. S. Cookson, B. T. Thorne, and A. H. M. Siddons.
M.B.—F. H. Finlaison and H. B. Tipler.

The following have been appointed members of the committee for medical radiology and electrology for 1936: Dr. T. S. Hele, Dr. G. S. Graham-Smith, Dr. G. H. Orton, Dr. E. P. Cumberbatch, Prof. Sidney Russ, and Dr. Russell Reynolds.

Society of Apothecaries of London

At recent examinations the following candidates were successful :—

MASTERY OF MIDWIFERY

Marion Bow, M. W. Ginsberg, Hilda Linford, H. T. Tate, and Elizabeth S. Walker.

Queen Alexandra's Hospital for Officers

Lord Melchett presided at the sixteenth annual reunion dinner of this hospital held at the Hotel Splendide on Nov. 29th, when nearly fifty of the former patients and members of the nursing staff were present. In proposing the health of the former patients, Lord Melchett sounded a note of hope and confidence, and in his reply, General T. A. Bigge expressed the appreciation of the officers for the devoted work of Mr. and Mrs. Herbert Paterson, the matron, nurses, and voluntary workers of the hospital.

Royal Free Hospital

On Nov. 28th the annual dinner of this hospital was held at the Savoy Hotel under the chairmanship of Dr. H. Haldin-Davis, who has lately resigned his position of dermatologist to the hospital and been elected to the consulting staff. In proposing the toast of the school and hospital he told the guests of some of the honours received during the past year. The Duke of York had consented to become president of the hospital; Dr. Chodak Gregory had been elected a Fellow of the Royal College of Physicians of London, being the second woman to be admitted to the fellowship; while Sir Alan Anderson had been elected M.P. for the City of London, and as a result had had to resign from the treasurership of the hospital though he was remaining on the council. Dr. Haldin-Davis referred to the generous provision which Lord Riddell, their late president, had made for the hospital in his will. Dr. D. C. Hare in an amusing speech proposed the health of the guests, who included Dr. Letitia Fairfield, Commander Stephen King-Hall, Sir Walter Moberly, Dr. Bentley Purchase, and Mr. and Mrs. F. W. Pethwick-Lawrence. Dr. Fairfield in reply spoke of the unique part which the voluntary hospitals played in the lives of the poor of London. If a rivalry existed between the L.C.C. as a hospital authority and the voluntary hospitals, it was a friendly and coöperative rivalry. Commander King-Hall who also replied related some incidents of the unorthodox but effective practice of medicine by amateurs in the Navy before admitting frankly his dissatisfaction with the tangible results of orthodox medicine. We live, he said, in a framework of time and space, but while we now voyage to the stratosphere in balloons and to the depths in submarines, our expectation of life had been only increased by a beggarly 15 years and the service for providing "spare parts" to our bodies was still inadequate. When time for eating and sleeping was deducted from our years of full activity he reckoned that we had but some 4261 working days at our disposal. Considering the enormous sums of money spent on research in other directions he felt that a grant of 20 million pounds to medical research would be proper; it would have great psychological value. Miss M. Rowland Jones proposed the health of the chairman. In dermatology, she said, it was easy to prescribe expensive lotions when what was needed was more soap and water and less food. But Dr. Haldin-Davis, like Elisha, did not hesitate to tell his patients to wash and be clean. The chairman in reply paid a tribute to Miss Widdows who had for many years acted with him as co-secretary for the dinner.

Voluntary Euthanasia

The inaugural public meeting of the Voluntary Euthanasia Legalisation Society will be held on Tuesday, Dec. 10th, at 8 P.M., in the Great Hall of the B.M.A. House, Tavistock-square. The chair will be taken by Lord Moynihan, president of the society, and the speakers include Mr. C. J. Bond, F.R.C.S., chairman of the executive committee, Dr. C. Killick Millard, hon. secretary, the Earl of Listowel, Lieut.-Colonel Sir Arnold Wilson, M.P., Miss Eleanor Rathbone, M.P., the Rev. Harold Anson, Master of the Temple, and the Rev. F. W. Norwood, D.D. The resolution to be presented at this meeting runs as follows: "That, in the interests of humanity, it is desirable that voluntary euthanasia should be legalised, subject to adequate safeguards, for persons who are suffering from incurable, fatal, and painful disease." Admission to the meeting is free and questions will be invited.

Pinsent-Darwin Studentship in Mental Pathology

Official notice is given that an election to the above studentship will be made in January, 1936. The studentship is of the annual value of not less than £225, and is tenable for three years. The student must engage in original research into any problem having a bearing on mental defects, diseases, or disorders, but may carry on educational or other work concurrently. Applications for appointment to the studentship should be sent before Jan. 1st to the secretary, Pinsent-Darwin Studentship, Psychological Laboratory, Cambridge. Applicants should state their age and qualifications and the general nature of the research that they wish to undertake. No testimonials are required, but applicants should give the names of not more than three referees.

Royal Surgical Aid Society

The 73rd annual meeting of this society will be held at the Mansion House, London, at 4 P.M. on Monday next, Dec. 9th, under the presidency of the Lord Mayor. The speakers will include Prof. G. Grey Turner, F.R.C.S., and Sir William Beveridge.

The Post-Certificate School

On Friday, Dec. 13th, a reunion will be held for friends and students of this school (77, Southampton-street, Camberwell, London, S.E.) to meet Dr. John Fairbairn. At 4 P.M. tea will be given at St. John's Home, Watson-street, Deptford, and at 5 P.M. Dr. Fairbairn will give an address at the school in Camberwell, his subject being Post Certificate Work.

Joint Tuberculosis Council

At the November meeting of the council it was decided to invite the Association of Thoracic Surgeons to appoint a representative. The chief business was the consideration of a report presented by Dr. J. B. McDougall on behalf of the Employment Committee dealing broadly with care and after-care schemes in this country and abroad. The circulation of this report was left to the British Legion Press. On behalf of the Institutions Committee Dr. F. J. C. Blackmore presented a note on tuberculosis institutions and chest hospitals. It was resolved that "This Council is of the opinion that the benefits of major surgery for both tuberculous and non-tuberculous conditions should be available to every patient in need of such treatment, and considers that steps should be taken by local authorities to provide facilities at tuberculosis institutions if adequate arrangements have not been, or cannot be, made at other institutions." A committee was appointed to consider and report to the next meeting on the standardisation of blood sedimentation tests. Dr. W. Brand gave an account of post-graduate courses held during the year. The course at the City of London Hospital had 22 participants, the study tour in Denmark (June 1st to 15th) 10 members. Dr. Peter Edwards had given six short intensive courses, and from Nov. 4th to 9th a course was held at the Brompton Hospital. A letter had been received from the College of Nursing asking for advice about precautions to prevent tuberculous infection among nurses. Dr. Esther Carling, Dr. Jane Walker, and Dr. James Watt were asked to report on this.

Royal Society of Medicine

The house and library of the society will be closed from Monday, Dec. 23rd, to Saturday, the 28th, inclusive.

Leeds School of Medicine

At the annual dinner of past and present students of this school, with Mr. E. R. Flint in the chair, Mr. C. H. Robinson, proposing The Staff, warned them that the students had no intention of specialising in each of the lecturers' special subjects. Responding, Mr. B. L. Jeaffreson spoke of the danger of surgery overshadowing medicine in the practice of the Infirmary; medicine pure and simple was just as important as surgery, if not more so. Dr. Stanley Sykes, proposing Past and Present Students, said that there were two stages in the life of the general practitioner. In the first, people said: "He seems a very nice doctor, but he is too young and inexperienced." In the second they said: "He is a very experienced doctor, but he is too old and out-of-date in his methods." There was no intermediate stage. In his response Mr. D. W. Currie defined medicine as "the art of amusing the patient while nature effects the cure."

Spahlinger Vaccine

A joint committee of the Medical Research Council and the Agricultural Research Council on Tuberculosis has issued in the form of a green paper (H.M. Stationery Office, 2*d*.) its observations on the experiment with Spahlinger vaccine in Northern Ireland (see THE LANCET, Oct. 19th, p. 892). The joint committee concludes that a case has been made out for further investigation, and that a thorough test should be made in this country, if Mr. Spahlinger is found willing to supply vaccine in sufficient quantity for the inoculation of a suitable series of animals. The committee urges however that, until the vaccine has been shown by further and extended experiments to be effective against natural as well as experimental methods of infection, its practical application should be deferred, and it deprecates the enforced general use of the vaccine until a thorough investigation has been made. The observations are signed by Dr. J. A. Arkwright, F.R.S. (chairman), Sir Merrik Burrell, Prof. J. B. Buxton, F.R.C.V.S., Prof. S. L. Cummins, M.D., Capt. S. R. Douglas, F.R.S., Mr. G. W. Dunkin, M.R.C.V.S. (joint secretary), Dr. A. Stanley Griffith, and Dr. N. F. Smith (joint secretary).

PARLIAMENT

NOTES ON CURRENT TOPICS

Opening of New Parliament

THE first session of the new Parliament was opened on Tuesday, Dec. 3rd. Owing to the illness of Princess Victoria, who died subsequently, there was no Royal procession and the session was opened by Lords Commissioners, the King's Speech being read by the Lord Chancellor, Viscount Hailsham.

In the course of the Gracious Speech it was stated that the Government are convinced of the need for an early and substantial development of the educational services of the country. A Bill would be introduced to amend the law in England and Wales relating both to the age of compulsory school attendance and to assistance from public funds towards expenditure on voluntary school buildings. Action would be taken in coöperation with local authorities and others to increase the effectiveness of the other educational services. In particular, the improvement of the school medical arrangements, the extension of physical education, and the development of technical schools would receive the attention of the Government. The Government would continue to promote actively the development of the social services and to take vigorous measures to improve the health and physique of the nation. They would press forward the work of slum clearance in order to ensure that the programmes submitted by local authorities were carried out within the period contemplated, and they would encourage the active administration of the Housing Acts of 1935 which enabled local authorities to make a direct attack on the evils of overcrowding. Careful consideration had been given by the Government to the organisation of the maternity services with a view to providing better care for women in childbirth and a Bill would be introduced for the provision by local authorities, in coöperation with voluntary associations, of an organised service of salaried midwives. The Government would continue to give close consideration to the further improvement of conditions in Scotland, and among measures to that end a Bill would be introduced providing for the raising of the school age.

Voluntary Hospitals (Paying Patients) Bill

In the House of Lords on Tuesday, Dec. 3rd, Lord LUKE presented the Voluntary Hospitals (Paying Patients) Bill, which was read a first time.

Debate on the Address

In the House of Commons on Tuesday, Dec. 3rd, Mr. W. W. WAKEFIELD (who wore the uniform of a flight lieutenant of the Royal Air Force with a black armlet) moved that a humble Address be presented to His Majesty thanking him for the Gracious Speech from the Throne. Mr. Wakefield said that the Gracious Speech had shown that there was little plausibility in charging the present Administration with neglect of the health of the people, particularly the well-being of the young. The revival of agriculture went hand in hand with the new realisation that we possessed in the rich soil of England all the essentials of a healthy diet. Milk was perhaps the outstanding example of a commodity which under the present handling was being increasingly consumed and produced. British agriculture, nurtured by science and sheltered in the transitional stage by tariffs, could build up the health of the rising generation. They had heard in the Gracious Speech that the school age was to be raised. There was another school from which they had played truant for too long; and it was only lately that they had set to work to establish minimum standards of health. They must banish "physical illiteracy" from their midst. External security was one essential. An unremitting zeal for improvement at home was another.

Mr. BALDWIN, Prime Minister, said that the Government regarded the social reform part of their programme as one of the most important parts of it, and they had decided to begin with their education plans. They had to make their choice as to what piece of legislation they should bring forward. There was a piece of reform which they were most anxious to get on with, and that was a Bill for the revision and consolidation of the law relating to the safety, health, and welfare of factory workers. Legislation on that subject had been examined and contemplated by many Governments, not even, he believed, excluding the last Labour Government. The present Government hoped and proposed to introduce that Bill in their second session. Referring to the Government's education proposals, Mr. Baldwin said that there were many questions connected with the health and physique of the children and various subjects of that kind where progress had been made by consultation with the local authorities and those would be got on with at an early date as soon as the Government were in a position to see that their Bill had become law. There was nothing of greater importance to-day than the all-round improvement, both mentally and physically, of our education. The Government hoped in the course of the session to get a Bill through so that unemployment benefit might be available for agricultural labourers in the winter of next year. Among other things the measures would entail a review of what was known as the means test. The Government believed it was necessary to retain the principle that unemployment assistance to which no contributions had been paid could not be paid without regard to needs, and that it would be necessary for the House of Commons to consider

most carefully any alteration of the existing rules in order to remove any occasion of hardship, and in particular to ensure the integrity of the family being kept intact. (Cheers.)

There was a subject which had been near his heart for many years before he had attained a position where he might have a hand in putting it through. That was the question of maternity and midwives. Here was a question upon which there could be no political conflict. He would try to peg out a claim now early by begging the House to see when they came to that Bill that if it commended itself to the House they might do their best to get it through this session. He did hope with regard to that most important piece of social legislation that they might be in a position to see it law before they went away for the summer holidays.

The debate on the Address in reply to the Speech from the Throne was adjourned.

Medical Diary

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Dec. 9th.
United Services. 4.30 P.M. Major S. H. Woods: Chronic Dental Infection as a Cause of Inefficiency in the Army.
TUESDAY.
Therapeutics and Pharmacology and Medicine. 5 P.M. Sir William Willcox, Prof. L. J. Witts, and Dr. E. C. Warner: Agranulocytosis.
Psychiatry. 8.30 P.M. Dr. Aubrey Lewis: Problems of Obsessional Illness.
FRIDAY.
Clinical. 5.30 P.M. (Cases at 4.30 P.M.) Dr. F. Parkes Weber and Dr. A. Schluter: 1. Chronic Anæmia, Leucopenia, Granulocytopenia, Thrombocytopenia with Absolute Increase of Lymphocytes. 2. Hirschsprung's Disease Treated by Bran in the Diet.
Ophthalmology. 5 P.M. Clinical Meeting at the Royal Westminster Ophthalmic Hospital, Broad-street, W.C.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, Dec. 9th.—8.30 P.M., Dr. Reginald Miller and Dr. William Moodie: The Care and Treatment of Difficult Children.

PADDINGTON MEDICAL SOCIETY.
TUESDAY, Dec. 10th.—9 P.M. (Great Western Royal Hotel, Paddington), Dr. Desmond Curran: States of Anxiety and Depression.

WEST KENT MEDICO-CHIRURGICAL SOCIETY.
FRIDAY, Dec. 13th.—8.45 P.M. (Miller General Hospital, Greenwich, S.E.), Mr. W. Sampson Handley: Gastric Derelicts.

NORTH LONDON MEDICAL AND CHIRURGICAL SOCIETY.
THURSDAY, Dec. 12th.—9 P.M. (Royal Northern Hospital, Holloway-road, N.), Dr. Bruce Williamson: Clinical Significance of the Cardiac Innervation.

SOUTH-WEST LONDON MEDICAL SOCIETY.
WEDNESDAY, Dec. 11th.—9 P.M. (Bolingbroke Hospital, Wandsworth Common), Dr. H. W. Barber: Ætiology and Treatment of Eczema and Psoriasis.

MEDICAL SOCIETY OF INDIVIDUAL PSYCHOLOGY.
THURSDAY, Dec. 12th.—8.30 P.M. (11, Chandos-street, W.), Dr. R. G. Macdonald Ladell: Medical Psychology: Pre-war, War-time, and Post-war: a Retrospect.

BIOCHEMICAL SOCIETY.
SATURDAY, Dec. 14th.—3.30 P.M. (Biochemical Department, University of Durham College of Medicine, Newcastle-upon-Tyne), Short Communications.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.
THURSDAY, Dec. 12th.—8.15 P.M. (Hospital for Tropical Diseases, Endsleigh-gardens, W.C.), Clinical and Laboratory Meeting.

PHARMACEUTICAL SOCIETY OF GREAT BRITAIN, 17, Bloomsbury-square, W.C.
TUESDAY, Dec. 10th.—8.30 P.M., Mr. Percival Hartley, D.Sc.: International Biological Standards for Drugs and Therapeutic Substances.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn-fields, W.C.
THURSDAY, Dec. 12th.—5 P.M., Dr. Cecil Wall: The Surgeons' Company, 1745–1800. (Thomas Vicary lecture.)

ROYAL SANITARY INSTITUTE, 90, Buckingham Palace-road, S.W.
TUESDAY, Dec. 10th.—5.30 P.M., Dr. E. J. Boome: The Cause and Modern Treatment of Speech Disorders.

ST. JOHN CLINIC, Ranelagh-road, S.W.
FRIDAY, Dec. 13th.—4.30 P.M., Dr. A. P. Cawadias: Physical Methods in Endocrinal Disorders.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Dec. 9th, to SATURDAY, Dec. 14th.—BROMPTON HOSPITAL, S.W. M.R.C.P. class. Choice of two sessions from those held on Mon., Tues., Thurs., and Fri. at 5 P.M.—CITY OF LONDON HOSPITAL, Victoria Park, E. M.R.C.P. class in diseases of heart and lungs, Wed. and Fri. at 6 P.M.—LONDON LOCK HOSPITAL, 91, Dean-street, W. Course in venereal disease daily at 2 P.M.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION.
WEDNESDAY, Dec. 11th.—4 P.M. (St. James's Hospital, Ouseley-road, S.W.), Mr. V. Z. Cope: Demonstration of Surgical Cases.

KING'S COLLEGE HOSPITAL, Denmark Hill, S.E.
THURSDAY, Dec. 12th.—9 P.M., Dr. E. Mapother: Psychology of the Tuberculous Patient.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
THURSDAY, Dec. 12th.—2 P.M., Mr. James Crooks: Nasal Catarrh in Childhood. 3 P.M., Dr. D. N. Nabarro: Congenital Syphilis (III.).
Out-patient clinics daily at 10 A.M. and ward visits (except on Wednesdays) at 2 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Dec. 9th.—10 A.M., skin clinic, medical wards. 11 A.M., surgical wards. 2 P.M., surgical and gynæcological wards, gynæcological and eye clinics.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., throat clinic. 4.15 P.M., Mr. Roche: Some Recent Urological Cases.
WEDNESDAY.—10 A.M., children's wards and clinic, medical wards. 2 P.M., eye clinic. 4.15 P.M., Mr. Woodd Walker: Reaction of Ossification to Trauma and Disease.
THURSDAY.—10 A.M., neurological and gynæcological clinics. Noon, fracture clinic. 2 P.M., eye and genito-urinary clinics. 4 P.M., venereal diseases.
FRIDAY.—10 A.M., skin clinic. Noon, lecture on treatment. 2 P.M., throat clinic.
SATURDAY.—10 A.M., children's and surgical clinics, medical wards.
The lectures at 4.15 P.M. are open to all medical practitioners without fee.
Operations, medical and surgical clinics daily at 2 P.M.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, Dec. 11th.—4 P.M., Mr. S. Boyd: The Surgery of the Biliary Passages.

GENERAL INFIRMARY, Leeds.
TUESDAY, Dec. 10th.—3.30 P.M., Dr. J. T. Ingram: Diet in Skin Cases.

PUBLIC DISPENSARY AND HOSPITAL, POST-GRADUATE COURSE, Leeds.
WEDNESDAY, Dec. 11th.—Dr. H. G. Garland: Mental Disorder in General Practice.

ROYAL INFIRMARY, Manchester.
TUESDAY, Dec. 10th.—4.15 P.M., Dr. E. W. Twining: Radiological Investigation of Intracranial Lesions.
FRIDAY.—4.15 P.M., Dr. A. Hillyard Holmes: Demonstration of Medical Cases.

ST. MARY'S HOSPITALS, Manchester.
THURSDAY, Dec. 12th.—4.15 P.M. (Whitworth-street West Hospital), Dr. Hunter: Female Sex Hormones.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE EAR, NOSE, THROAT AND CHEST, Hardman-street, Manchester, 3.
WEDNESDAY, Dec. 11th.—4.30 P.M., Mr. B. P. Robinson: Tonsils and Adenoids.

GLASGOW POST-GRADUATE ASSOCIATION.
WEDNESDAY, Dec. 11th.—4.15 P.M. (Ear, Nose, and Throat Hospital), Dr. W. C. Macartney: Otitis Media.

Appointments

BAKER-BATES, E. T., M.D. Liverp., M.R.C.P. Lond., has been appointed Hon. Assistant Physician to the Liverpool Hospital for Consumption and Diseases of the Chest.

BRAIN, R. T., M.D., F.R.C.P. Lond., Hon. Dermatologist to the Royal Free Hospital.

MACLEOD, DOUGLAS, M.S., M.R.C.P. Lond., F.R.C.S. Eng., M.C.O.G., Second Obstetric Surgeon to Out-patients at St. Mary's Hospital, London.

MILLER, ARTHUR, F.R.C.S. Eng., Consulting Oto-laryngologist to the Chiswick and Ealing Fever Hospitals.

PAGE, A. P. M., M.D., M.R.C.P. Lond., Deputy Medical Superintendent at the City General Hospital, Leicester.

St. Thomas's Hospital.—The following appointments are announced:—
MITCHINER, P. H., M.S., M.D. Lond., F.R.C.S. Eng., Surgeon;
BARRETT, N. R., M.Chir. Camb., F.R.C.S. Eng., Surgeon in Charge of Out-patients;
DOYNE, P. G., M.B. Oxon., F.R.C.S. Eng., Ophthalmic Surgeon; and
PENHAM, G. G., M.B. Camb., F.R.C.S. Eng., Ophthalmic Surgeon in Charge of Out-patients.

Certifying Surgeons under the Factory and Workshop Acts: Dr. R. F. SIMKIN (Melbourne District, Leicester); Dr. W. R. C. CAMPBELL (Helensburgh District, Dumbarton).

NOTES, COMMENTS, AND ABSTRACTS

DR. JOHN HALL: SHAKESPEARE'S SON-IN-LAW [1]

No more fitting place could, I think, have been chosen for this commemoration of the 300th anniversary of Dr. Hall's death than this building—the home of his daughter Elizabeth and her husband Tom Nash—the windows of which look out on to the now vacant site of New Place in which the doctor lived and died. The documents and other objects which have been brought together for this occasion have been obtained from various sources—the records have come from the Stratford-upon-Avon Corporation archives, the collections of the Birthplace Trust, and the parish chest. The contemporary drug jars, mortars, and other reminders of the apothecary's art have been kindly lent by Dr. D. S. Murray and Mr. J. Whitmore Peck, and the very valuable case of early seventeenth century surgical instruments is a loan from the Royal College of Physicians of London. With regard to the documents it is remarkable that after such a lapse of time it should be possible to assemble such a collection, illustrating as it does the life of one of Stratford's most prominent townsmen—prominent not only for his close personal connexion with Shakespeare, and his influence on the poet's later work—but also on account of his own special qualities and his great renown in the town and neighbourhood. These records present all the dominant phases of the doctor's career as a townsman of Stratford-upon-Avon. We find there evidence of his shrewd and businesslike concern in the estate bequeathed to his wife by Shakespeare; his kindly nature in the preservation of the home of his wife's sister, Judith Quiney, when threatened with the loss of it through her husband's bibulous excesses; his earnest Puritanism in the discharge of his duties as a churchwarden for the borough; his munificence to the parish church; his service as a member of the town council; his efforts and failure to reconcile his work as a physician with the demands made upon his time by an inconsiderate corporation, and his subsequent expulsion from that body; and his championship of the vicar and litigation on his behalf against the town council; while from his printed case-book we can follow him up and down the county—and far outside it—treating rich and poor alike—"even such as hated him for his religion," recording his successful cures with many an expression of devout thanks for heavenly aid.

John Hall was born in 1576, the son of William Hall, a Worcestershire doctor, whom we find settled at Acton, Middlesex, at the time of his death in 1607. From the terms of his will he appears as an astrologist and alchemist. John Hall graduated B.A. at Oxford in 1595, three years later became M.A., and from Oxford he went to the continent, as many medical students did, and obtained a degree, probably in France. The first reference to his presence in Stratford is the entry in the parish register on June 5th, 1607, of his marriage to Shakespeare's elder daughter Susannah, she being then 24, he 31 years of age. In Stratford he soon acquired a large and fashionable practice, extending into and beyond the neighbouring shires. Catholics were among his patients, notwithstanding his Puritan views, in which, apparently, he had the full sympathy of his wife. Tradition connects him with the house in Old Town called Hall's Croft, from which he removed to New Place on Shakespeare's death in 1616.

Shakespeare's description of the lord Cerimon in *Pericles* might be a word-portrait of Dr. Hall. Gentlemen roused from their beds by the storm, find Cerimon up and about at dawn, ready for patients that the tempest might bring, dispatching his man to the apothecary He says in reply to their astonishment:

> 'Tis known I ever
> Have studied physic, through which secret art
> By turning o'er authorities, I have
> Together with my practice, made familiar
> To me and to my aid the blest infusions
> That dwell in vegetives, in metals, stones;
> And I can speak of the disturbances
> That Nature works, and of her cures; which doth give me
> A more content in course of true delight
> Than to be thirsty after tottering honour
> Or tie my treasure up in silken bags
> To please the fool and Death (III., ii., 31–42).

The lines that follow might be a prophesy of Hall's coming reputation:

> Your honour has through Ephesus poured forth
> Your charity, and hundreds call themselves
> Your creatures who by you have been restored:
> And not your knowledge, your personal pain, but even
> Your purse still open, hath built Lord Cerimon
> Such strong renown as Time shall never end (43–8).

I will not discuss at length the extent of Shakespeare's knowledge of medicine.

Dr. John Hall, with his wife and daughter Elizabeth, 8 years old, if not already in residence at New Place, came there from Old Town on the poet's death in 1616. The Stratford Corporation, eager to have him as a member, elected him a burgess on March 14th, 1617. He pleaded his professional duties and was excused. He was an active churchman and Puritan, and a devoted admirer of the eloquent, headstrong vicar, Thomas Wilson. In 1622 he was again elected a burgess and again excused. His practice had grown very considerably and he rode, with his surgeon's box behind him, so far afield as Northampton, Worcester, and Ludlow. His patients included the Earl of Warwick, the Earl and Countess of Northampton, Lady Beaufoy ("godly, honest, being of a noble extract, healthful till the age of 28, which was 1617 July 1"), Lady Rouse, Mistress Mary Talbot ("a catholic, fair", . . . "such as hated him for his religion often made use of him"), Lady Puckering, Lady Browne of Radford, Lady Smith ("Roman Catholic, cruelly afflicted with wind"), Lady Dickenson ("fair, pious, chaste, vexed with pain of the head"), Lady Underhill and other of her family, Sheldons, Throgmortons, Rainsfords, Master Drayton ("an excellent poet, labouring of a tertian") and many others of note. Of his wife and daughter, he writes (in Latin): "Mistress Hall of Stratford, my wife, being miserably tormented with the colic" . . . "was troubled with the scurvy, accompanied with pains of the loins, melancholy etc. . . . I freed her from pain Feb. 9, 1630/1." Of their daughter, Shakespeare's grand-daughter, he records: "Elizabeth Hall my only daughter, was vexed with *tortura oris* or the convulsion of the mouth and was happily cured . . . . 5 Jan. 1624/5." In the beginning of April she went to London (probably to participate with her father in functions consequent on the death of King James on March 24th, and the accession of Charles I.), and returning homewards the 22nd of the said month "she took cold and fell into the said distemper on the contrary side of the face, and although grievously afflicted with it, yet by the blessing of God she was cured in sixteen days as followeth . . . her neck was fomented with aqua vitæ, in which was infused nutmegs, cinnamon, cloves, pepper; she ate nutmegs often. In the same year May the 24th, she was afflicted with an erratic fever: sometimes she was hot, bye and bye sweating, again cold, all in the space of half an hour, and thus she was vexed oft in a day. [Then he gives the prescription and adds] Thus was she delivered from death and deadly disease and was well for many years, to God be praise."

On March 1st, 1624–25, Dr. Hall assigned to the corporation for £400 the lease, which had still eleven

[1] The substance of an address delivered in the New Place Museum, Stratford-on-Avon, on Monday, Nov. 25th, to mark the tercentenary of Dr. John Hall, Shakespeare's son-in-law. The address was delivered by Mr. FREDERICK C. WELLSTOOD, F.S.A., secretary and librarian to the Shakespeare's Birthplace Trust, and was illustrated by original records and other objects bearing on the life of Dr. John Hall.

years to run, of the tithes of Old Stratford, Welcombe, and Bishopton, which Shakespeare had purchased for £440 in 1605, and bequeathed to his daughter and her husband. In February, 1626, he was fined £10 for refusing a knighthood on the Coronation of King Charles I. On April 22nd in that year his daughter Elizabeth was married to Thomas Nash of Lincoln's Inn, son of Anthony Nash of Welcombe, to whom her grandfather bequeathed a memorial ring. She was just over 17, he just under 33 years of age. In 1628–29 Dr. Hall, the ardent supporter of the vicar, Thomas Wilson, served as a churchwarden for the parish. With his fellow-wardens, Anthony Smith and George Barton, he fulfilled his duties energetically, presenting parishioners for "loitering forth of church at sermon-time," "sleeping in the belfry with a hat on upon the Sabbath," "keeping drinking in a house on the Sabbath," and "in the company of an excommunicated person," keeping "naughty company," "wearing a hat in church," and being a "common romler," "being abroad seen by the Constable at sermon-time," "for late coming to Church" and "having no employment but laziness," "using beastly behaviour," "calling a woman witch," and "being a common swearer and blasphemer" or "drunkard." Much against his will Dr. Hall was elected a burgess in May, 1632. Twice before he had successfully made excuse, but now he had to yield, partly to answer for his participation with the vicar in suits against the corporation. His membership lasted but sixteen months, and his presence when he did attend the council meetings was, to say the least, disturbing. The minutes of June 30th, 1632, record that he had neglected to attend and take his oath, although warned by both the chamberlains and the serjeants. He was warned again for July 6th, but in response to a pleading and indignant letter from a patient demanding his attendance he again made default.

[This letter, which was exhibited at the meeting, set forth in an urgent way the claims of professional over public duty.]

Hall had to contend with the family difficulties of his brother-in-law, Thomas Quyney of The Cage Tavern, now the Judith Quiney Café. Quyney, who was a vintner, fell, like Bardolf, a victim to the temptations of his calling. He was fined for absence from corporation meetings, for swearing, for suffering tippling in his house, and was passed over for promotion to aldermanic rank. On March 13th, 1633, Dr. Hall, his son-in-law Thomas Nash, and Richard Watts, who had married Quyney's sister Mary, took over the lease of the Cage in trust for his wife and children. [This document was also exhibited.]

On one occasion Hall was called upon to answer and submit himself to the corporation for abusive speeches against the bailiff, Richard Castle, known locally as "Shake-Elbows." Influence with Wilson, the vicar, and the Bishop had enabled the doctor to change his pew in the church from one near the pulpit on the south of the nave (that hitherto allotted to New Place and no doubt occupied by Shakespeare and his family) to another on the north side of the nave, at the upper end, "enjoyed time out of mind" by the aldermen and their wives. The bailiff and his brethren of the council not unnaturally resented their exchange. They objected also to Hall's denunciation of them for a breach of contract with the vicar. This was one of Dr. Hall's last attendances and doubtless a stormy one. On Oct. 9th, by 19 votes to 3, he was expelled from the council for "wilful breach of orders, sundry other misdemeanours, and continual disturbances." A Sunday or two later a scuffle occurred for possession of the aldermanic pew which led to the vicar holding a special court at New Place. The breach between vicar and corporation widened. He and Dr. Hall filed a petition in Chancery for the increase of the stipends of both vicar and schoolmaster, "according to the intent of the Charters." Notwithstanding the doctor's sale to the corporation of his lease of the tithes "for less money than the same was worth by a hundred pounds at least" to maintain the vicar's salary to £60, they had reduced it, and for about the space of ten years last past, they had "utterly suppressed, omitted & neglected the payment of £20 per annum to the Schoolmaster." They charged the corporation, moreover, with "feasting and private use of the revenues." Interesting as they are, however, the details of the quarrel are too long to recapitulate here. Dr. Nathaniel Brent, the Vicar's General of the Diocese, opened an inquiry at Stratford. He awarded Dr. Hall his new pew "on the north side of the nave at the upper end" if he decided within a month to take it. In his evidence Dr. Hall states that he and his son-in-law, Thomas Nash, "did paye and contribute deepely towardes the repayres of the sayd Church, and that he the sayd Mr. Hall had beene a benefactor and bestowed a new pulpit at his owne charge, and alsoe that the seate was assigned vnto him by the Lord Bushopp of the diocese by an instrument vnder his episcopall seale wch. he then produced." [This document was also exhibited.]

The vicar was suspended for three months. Hall did not long survive his friend's suspension. He died suddenly on Nov. 25th within a few days of his neighbours, Henry Norman and Richard Walford. They may have been carried off by the same malady—for which perhaps he attended his fellow victims with fatal consequence. The burial entry in the parish register describes him as "Medicus Peritissimus." On his grave, near to Shakespeare's, were inscribed the lines—being translated—"Here lies Hall, very renowned for his medical skill, awaiting the joys of the Kingdom of God. Worthy was he, for his merits, to outdo Nestor in years, but on earth a like Day lays hands on all."

Mr. Wellstood closed his interesting lecture by a reference to the case-books and confidential papers, some no doubt inherited from Shakespeare, which were bequeathed by Hall in his will to his son-in-law Tom Nash. Hall's manuscript books were bought by one Dr. James Cook, and a translation of selected cases was published in 1657 and again in 1679 and 1683. These volumes were exhibited with photographs of certain of Dr. Hall's manuscript pages now in the British Museum. Hall's familiarity in the making up of his prescriptions was indicated by the number of his drug jars which were exhibited. The surgical instruments exhibited were in use in Hall's time and represent the armamentarium of a doctor of the Stuart period.[2] Of these, Mr. Wellstood said: They were made probably about 1631, and were presented to the College of Physicians of London in 1635 by Dr. Thomas Prujean. This collection, consisting originally of over 100 instruments, must have been of considerable value even at that period and the donor himself described it as "a precious storehouse of the art of the chirurgien." The donor, Dr. Thomas Prujean, was the son of Sir Francis Prujean, and was admitted a candidate for the Licentiate of the College of Physicians on April 4th, 1653, by his father, who was then President, and in commemoration of that event presented the case of instruments to the College on the same date. He was admitted as a Fellow in October, 1657, and died in October, 1662. Sir Francis Prujean, the father, was President of the College from 1650 to 1655, and is referred to in the diaries of both Pepys and Evelyn.

NEW PREPARATIONS

MELTIS "SIONON" CHOCOLATE.—Sionon is the trade name for D-sorbitol, a polyhedric alcohol closely related to the hexoses. In THE LANCET just two years ago Payne, Lawrence, and McCance stated their conclusion that while the quantity taken daily should not exceed 50 g. in divided doses (in view of the possibility of intestinal irritation) "Sionon can safely be used as a sweetening agent

[2] A full description of the surgical instruments exhibited was given in the *Medical Press and Circular* of Oct. 26th, 1927, by Mr. C. J. S. Thompson, hon. curator, historical section, museum of the Royal College of Surgeons of England.

for diabetics as it does not enter directly into carbohydrate metabolism." Acting on this favourable verdict Messrs. Meltis Ltd. (Keetons-road, London, S.E. 16) have produced a chocolate sweetened with sionon which is recommended for the use of diabetics and others whose sugar intake is restricted. It is sold in cartons holding forty napolitains, each of which is said to contain approximately: sionon, 1·0 gramme; milk-sugar and other carbohydrate, 1·0 g.; protein, 0·5 g.; and fat, 2·0 g. Judged as a sweetmeat the chocolate is of excellent quality, and to many palates the fact that it is not very sweet will seem an advantage. The carton bears the statement: "For diabetics—safe, palatable, nutritious."

CEROCOL.—Cerium oxalate has long been used for the relief of vomiting—especially the vomiting of pregnancy. As it is all but insoluble in water its action is generally held to be mechanical, resembling that of bismuth salts. Cerocol (distributed by Messrs. Coates and Cooper Ltd., 94, Clerkenwell-road, London, E.C. 1) is described as "a colloid-soluble form of cerium oxalate" which is "readily absorbed," and is held to have decided advantages over the form ordinarily prescribed. Prepared in small tablets, each containing 0·05 gramme of colloidal cerium oxalate, it is almost tasteless, and is said to be non-poisonous even in multiple doses. It is recommended, among other conditions, for vomiting from all causes, including sea and train sickness, and for nausea.

Vacancies

For further information refer to the advertisement columns

Aberdeen Royal Mental Hospital.—Sen. Asst. Physician.
Ashford Hospital, Kent.—Res. M.O. £150.
Battersea General Hospital, Battersea Park, S.W.—H.S. Also H.P. At rate of £130 and £120 respectively.
Benenden, Kent, National Sanatorium.—Jun. H.P. At rate of £150.
Birmingham Royal Cripples Hospital.—Res. H.S. At rate of £200.
Bradford, Royal Eye and Ear Hospital.—H.S. £160.
Brighton, Royal Alexandra Hospital for Sick Children.—H.P. £120.
Brighton, Sanatorium and Infectious Disease Hospital.—Jun. Res. M.O. At rate of £250.
Brighton, Sussex Eye Hospital, Eastern-road.—H.S. At rate of £150.
Bristol General Hospital.—Res. Surg. O. and Reg. £200. Also two H.P.'s, three H.S.'s, Res. Obstet. O., H.S. to Spec. Depts., also Cas. H.S. Each at rate of £80.
Chelsea Hospital for Women, Arthur-street, S.W.—Surgeon.
Chesterfield and North Derbyshire Royal Hospital.—H.S. to Ear, Nose, and Throat and Eye Depts. At rate of £150.
Children's Hospital, Hampstead, N.W.—Res. M.O. At rate of £150.
China, Mission Hospital.—Two Medical Men.
City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—Res. M.O. £250. Also H.P. At rate of £100.
Coventry and Warwickshire Hospital.—Res. H.S. £125.
Denbigh County.—Deputy County M.O.H. and School M.O. £700.
Derbyshire Royal Infirmary.—Ophth. H.S. and Anæsthetist. £150.
Doncaster Royal Infirmary.—H.P. At rate of £175.
Eastern Hospital, Homerton-grove, E.—Med. Supt. £1100.
East Grinstead and District New Hospital.—Hon. Consultants to Special Depts.
Evelina Hospital for Sick Children, Southwark, S.E.—H.S. £120.
Exminster, Devon Mental Hospital.—Jun. Asst. M.O. and Pathologist. £350.
Glasgow, Lightburn Joint Hospital, Shettleston.—Res. Physician. £350.
Hampshire County Council.—Asst. Tuber. Officer. £700.
Hastings, Royal East Sussex Hospital.—Jun. H.S. At rate of £150.
Hospital for Epilepsy and Paralysis, Maida Vale, W.—Surg. Reg. £100.
Hospital for Sick Children, Great Ormond-street, W.C.—Res. H.P. Also Res. H.S. Each at rate of £100.
Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.—Res. H.P. At rate of £100.
Huddersfield Royal Infirmary.—Res. Surg. O. £225–£250.
Ilford, West Ham Mental Hospital, Goodmayes.—Jun. Asst. M.O. £350.
Leeds, Killingbeck Sanatorium.—Sen. Asst. Res. M.O. £425.
Liverpool Hospital for Consumption and Diseases of the Chest, Mount Pleasant.—Asst. M.O. and Pathologist. £150.
London Homœopathic Hospital, Great Ormond-street, W.C.—Asst. Physician for Diseases of Women, also Hon. Asst. Physician.
London Hospital, E.—Hon. Asst. Anæsthetist.
London Lock Hospital, 283, Harrow-road, W.—Res. M.O. for Male Depts. At rate of £175.
Manchester, Ancoats Hospital.—Asst. Pathologist. £300.
Manchester, Duchess of York Hospital for Babies.—Orthopædic Registrar.
Manchester Royal Eye Hospital.—Jun. H.S. £120.
Manchester Royal Infirmary.—Res. M.O. £200.
Manchester, St. Mary's Hospitals.—H.S.'s for Special Hospitals. Each at rate of £50.
Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.—Res. M.O. At rate of £100.
Miller General Hospital, Greenwich-road, S.E.—Refractionist. 52 guineas.
National Hospital for Diseases of the Nervous System, Queen-square, W.C.—Two H.P.'s. Each £150. Also Visiting M.O. for Convalescent Home.
National Temperance Hospital, Hampstead-road, N.W.—Cas. O. At rate of £120.
Nottingham General Hospital.—H.S. At rate of £150.
Oldham Royal Infirmary.—Cas. O. and H.S. and Physician. At rate of £175.
Oswestry, Robert Jones and Agnes Hunt Orthopædic Hospital.—Res. Surg. O. £350.
Penshurst, Cassel Hospital for Functional Nervous Disorders, Swaylands.—Asst. Physician. £750.
Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Res. Anæsthetist. At rate of £100.
Queensland, Australia, Boulia Hospital.—M.O. £500.
Radium Institute, Riding House-street, W.—Asst. M.O. At rate of £250. Also H.S. At rate of £150.
Redhill, Reigate Institution, St. John's.—Res. Asst. M.O. At rate of £250.
Romford, Oldchurch Hospital.—Asst. Res. Surgeon. £500.
Royal Masonic Hospital, Ravenscourt Park, W.—Res. M.O. £300.
Royal Northern Hospital, Holloway, N.—H.S. At rate of £70. Also Hon. Radiologist.
St. Bartholomew's Hospital, E.C.—Physician.
St. John's Hospital, Lewisham, S.E.—H.S. At rate of £100.
St. Mary's Hospital, W.—Jun. Asst. Radiologist. £75.
St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.—Clin. Assts.
Salford Royal Hospital.—H.S. At rate of £125.
Salisbury General Infirmary.—H.P. At rate of £125.
Samaritan Free Hospital for Women, Marylebone-road, N.W.—Radiologist.
Sheffield Royal Infirmary.—Clin. Asst. to Surgical Dept. At rate of £300.
Staffordshire General Infirmary.—H.P. and Cas. O. At rate of £150.
Stockport Infirmary.—H.P. £150.
Stoke-on-Trent, North Staffordshire Royal Infirmary.—Second H.P. At rate of £150.
Sunderland Royal Infirmary.—H.S. £120.
Surrey County Council.—Asst. M.O. £600.
Swansea General and Eye Hospital.—Res. Anæsthetist. £150.
Walsall County Borough.—Asst. M.O. £600.
West Bromwich and District General Hospital.—H.S. At rate of £200.
West London Hospital, Hammersmith-road, W.—Med. Reg. £250. Also H.P. and two H.S.'s. Each at rate of £100.
Westminster Hospital, Broad Sanctuary, S.W.—Obstet. Surgeon.
Weston-super-Mare General Hospital.—Res. H.S. £150.
Wickford, Essex, Runwell Hospital.—Deputy Med. Supt. £650.
Willesden General Hospital, Harlesden-road, N.W.—Res. Cas. O. At rate of £100. Also Hon. Clin. Assts. to Out-patient Depts.
Winchester, Royal Hampshire County Hospital.—Res. Surg. O. Also H.P. At rate of £200 and £125 respectively.
Windsor, King Edward VII. Hospital.—Three H.S.'s. Each at rate of £100.
Wolverhampton, New Cross Hospital and Institution.—Asst. Deputy M.O. £350.
Wolverhampton Royal Hospital.—H.S.'s. Each at rate of £100.

The Chief Inspector of Factories announces vacancies for Certifying Factory Surgeons at Chorley (Lancashire) and Abergavenny (Monmouth).

Births, Marriages, and Deaths

BIRTHS

CATER.—On Nov. 25th, the wife of Donald Cater, M.B. Camb., of the Lester Chinese Hospital, Shanghai, of a daughter.
MILBANK.—On Nov. 25th, at Bickley, the wife of Dr. R. J. Milbank, of a son.

MARRIAGES

MANSIE—KIRKPATRICK.—On Nov. 29th, at Belhaven Church, Glasgow, James Walker Mansie, M.R.C.S. Eng., L.D.S. R.C.S. Eng., of Putney, to Catherine Enid, second daughter of Mr. and Mrs. Duncan T. Kirkpatrick, of Glasgow.
PENNINGTON—COBB.—On Nov. 28th, at St. Paul's Church, Portman-square, London, Drury Pennington, M.B. Camb., to Ethel Margaret Cobb.

DEATHS

BOND.—On Dec. 2nd, suddenly, in Cheltenham, Lt.-Col. Richard Pratt Bond, R.A.M.C. retd., of Woodside, Copthorne, Sussex.
HATCH.—On Nov. 27th, at Cheltenham, Lieut.-Colonel William Keith Hatch, M.B. Aberd., F.R.C.S. Eng., Indian Medical Service (retd.).
WHITE.—On Nov. 28th, at Shrewsbury, Ernest William White, Lieutenant-Colonel, C.B.E., M.B. Lond., Emeritus Professor of Psychological Medicine, King's College, London.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.